MODEL AIRPLANE NEWS

11th Year of Publication

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OCTOBER, 1939
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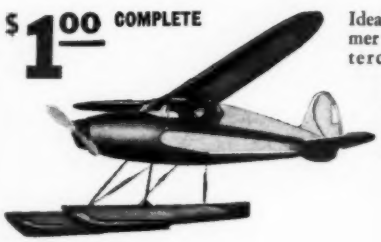

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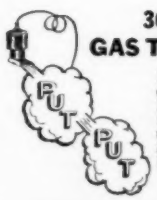

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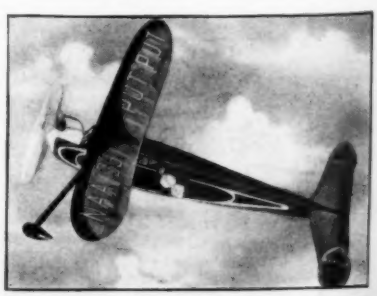

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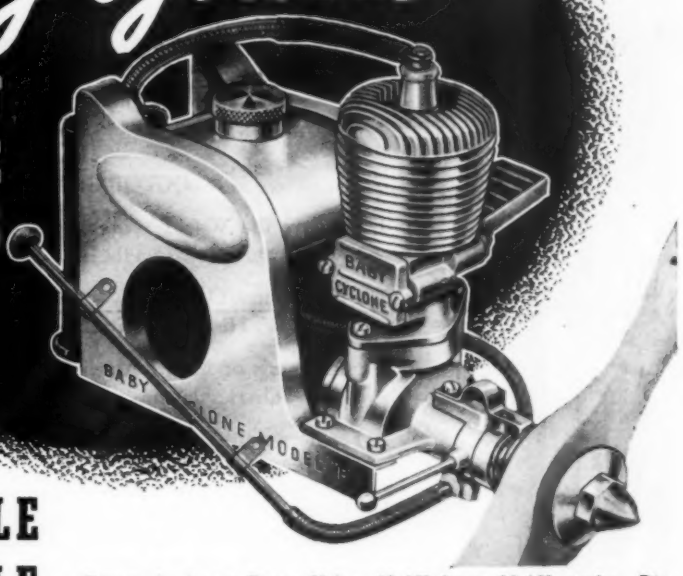

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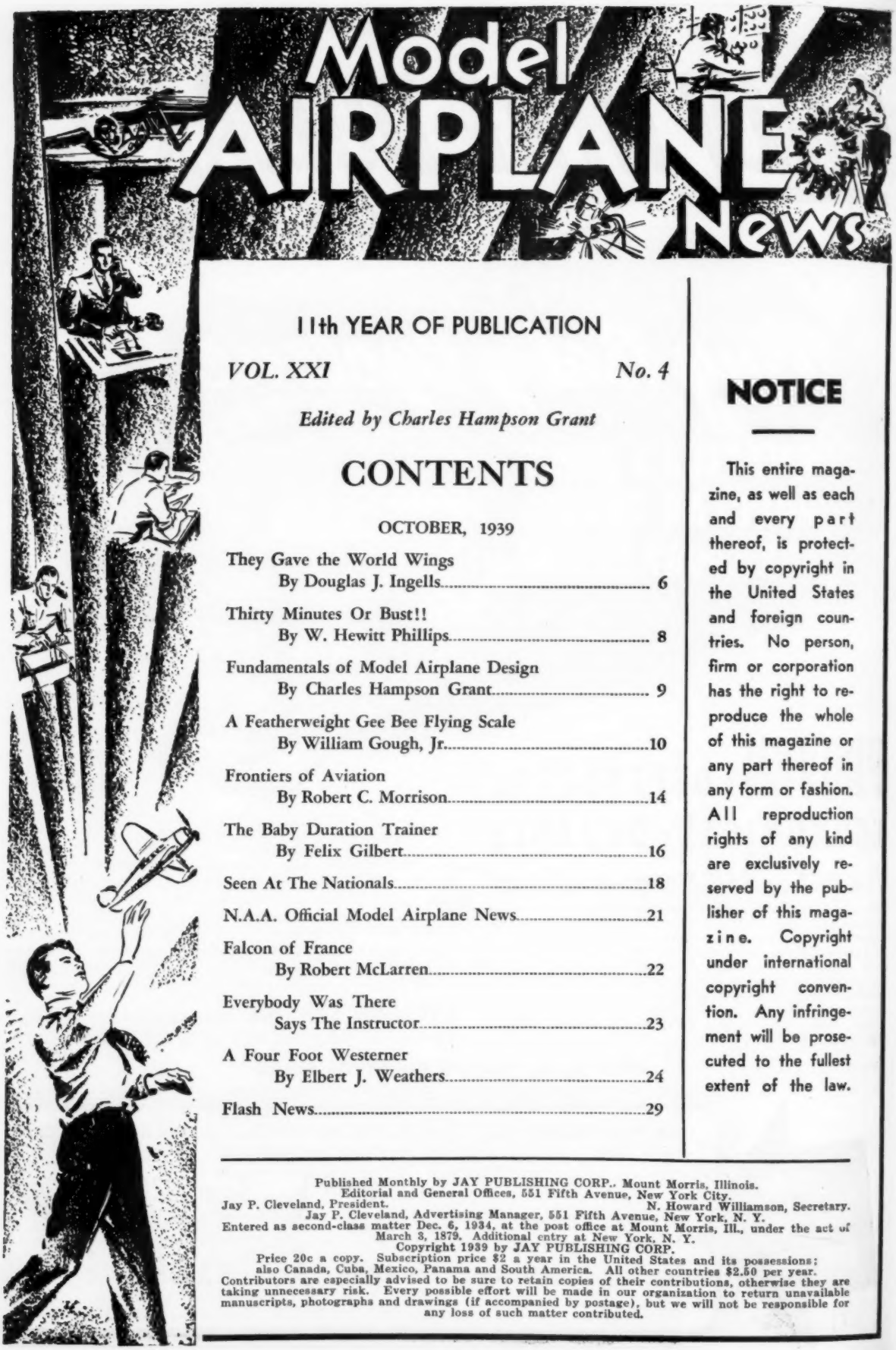

11th YEAR OF PUBLICATION

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Edited by Charles Hampson Grant

CONTENTS

OCTOBER, 1939

They Gave the World Wings
By Douglas J. Ingells..... 6

Thirty Minutes Or Bust!!
By W. Hewitt Phillips..... 8

Fundamentals of Model Airplane Design
By Charles Hampson Grant..... 9

A Featherweight Gee Bee Flying Scale
By William Gough, Jr.....10

Frontiers of Aviation
By Robert C. Morrison.....14

The Baby Duration Trainer
By Felix Gilbert.....16

Seen At The Nationals.....18

N.A.A. Official Model Airplane News.....21

Falcon of France
By Robert McLarren.....22

Everybody Was There
Says The Instructor.....23

A Four Foot Westerner
By Elbert J. Weathers.....24

Flash News.....29

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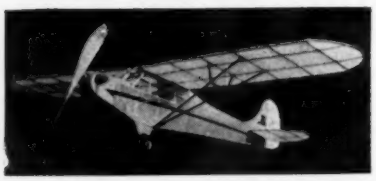

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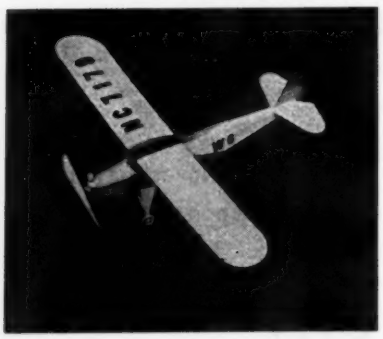

GT2—"MERCURY"

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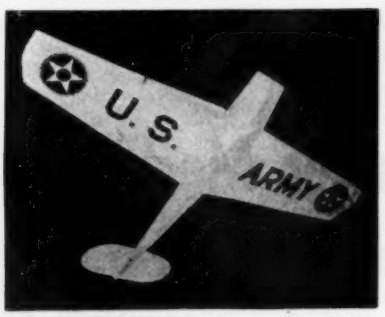

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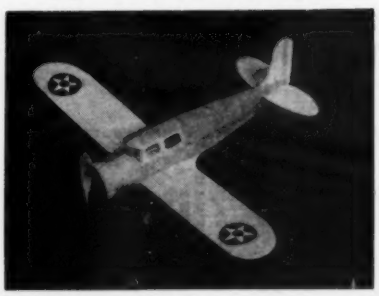

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192	Rearwin	198	Endurance
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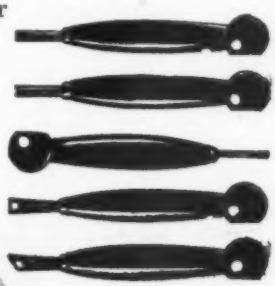

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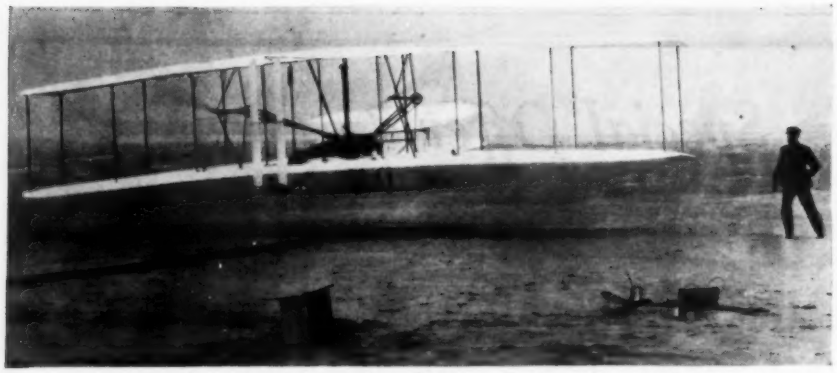


Actual picture of the first airplane flight ever made: Kitty Hawk 1903

Orville Wright (Mayfield)

THEY GAVE THE WORLD

By DOUGLAS J. INGELLS

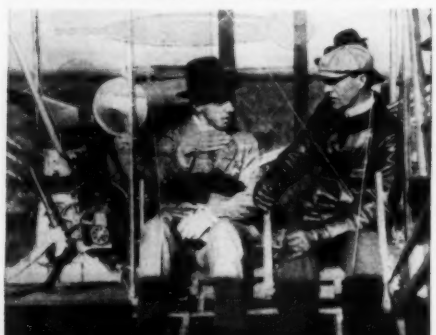
Wilbur and Orville Wright in France

WINGED giants, flight after flight of them, roared into the heavens. Celebrating, they were, the 30th anniversary of the U.S. Army Air Corps, and Uncle Sam's warbirds put on a display of air might which will not soon be forgotten. From coast-to-coast they spread their wings to show the world America's SUPREMACY IN THE AIR.

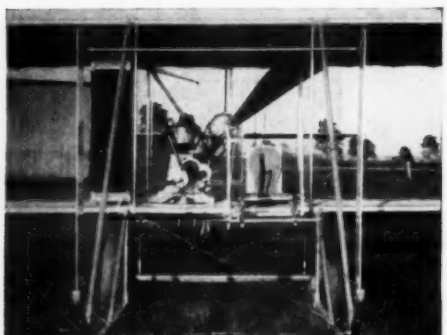
Supreme they were, and they went out to prove it. Glistening, silvery-winged bombers and bullet-like pursuit planes—the mightiest and the smallest—all of them did their part to make this "big party" a memorable one. And the hard, cold facts and figures that comprise the records are proof enough that the job was well done.

So new that it was "fresh off" the assembly line at the Boeing factory in Seattle, Washington, a giant "Flying Fortress" piloted by Maj. Stanley M. Umstead, chief of the army's test pilots, sped across the continent in 9 hours and 15 minutes to set a new transcontinental record for multi-engined planes. A sister ship established an international speed record carrying 5 1/2 tons 621.37 miles at 20,000 feet in the air at 259.398 miles per hour. And the "big brother" to the "Flying Fortresses," the XB-15 bomber, largest land plane in the world, lifted 15 1/2 tons to eight thousand feet to return a world record to America. An amphibian made by Grumman set another world speed record over a specified course.

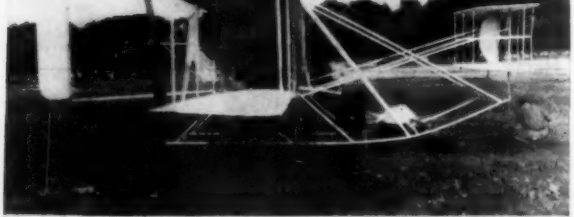
These were the gifts, presents from science and invention, for these two pillars of



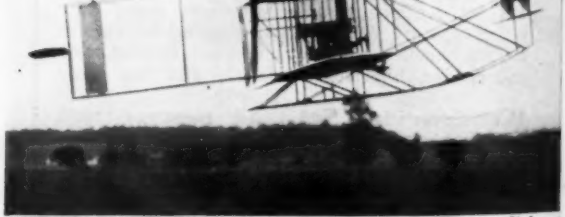
Wilbur Wright in Spain instructs King Alfonso how to fly in an old Wright Model A



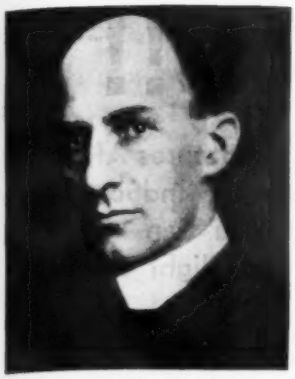
A rare picture of a Wright Model E; the only model that mounted only one propeller



The first U.S. Army plane purchased by the Air Corps, at Fort Meyer 1909. It crashed later (Mayfield)



An early Wright plane just after being catapulted into flight at Simms Station, Dayton, near the present airport (Mayfield)



Wilbur Wright (Mayfield)

The new 330 m.p.h. Martin Bomber; latest word in fighting planes (Intern'l)

Wings

industry were responsible for the design and engineering, the daring and patience, which made possible such performance records. Nor could any other gifts be more appropriate at such a birthday party. They put gleam and sparkle into the eyes of Maj. General Henry H. Arnold, chief of the air crops, and they made every good citizen's heart swell with pride.

But on this day the air corps chief had other things on his mind, thoughts which were reminiscent of the occasion that marked the beginning of all this. It was August 2nd, thirty years to the day after Uncle Sam had purchased his first military airplane from the Wright Brothers in 1909, and "Hap" Arnold, as the "Early Birds" know him, was getting a real thrill out of seeing the new and remembering the old.

It was not difficult to lose oneself in reveries on this day for even the site where the greatest part of the celebration was held, Wright Field in Dayton, Ohio, was symbolic of the early beginning. Here, on the very grounds where Wilbur and Orville Wright made some of their early experimental flights, 75,000 air-minded citizens had gathered to pay tribute to the founders of flight and the builders of the first military airplane. Then, too, the very earliest of the "Early Birds," Col. Frank P. Lahm and Col. Frederic E. Humphreys, who were the first officers to fly in an army plane were there to refresh one's memory.

The Wrights at Kitty Hawk

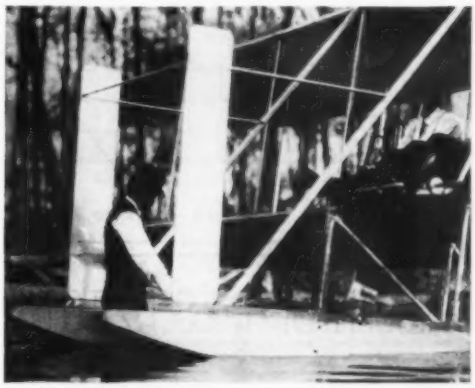
Actually the beginning was back in 1903 on that bleak, cold December day when Orville Wright first proved to the world that man could fly in a power-driven, heavier-than-air machine.

Red-faced and shivering, chilled by the icy cold winds that blew inland from the Atlantic off Cape Hatteras, a U. S. Coast Guardsman burst breathlessly into the telegraph office at Kitty Hawk, North Carolina, to bring word of man's first successful flight.

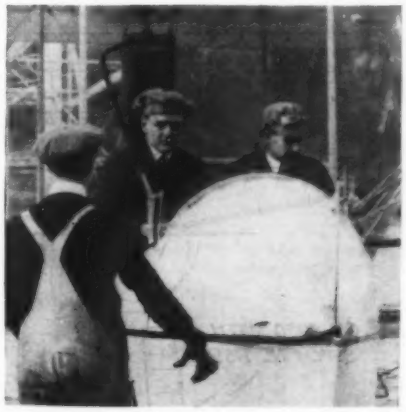
"They've done it. They've done it, danged if they ain't flew," he shouted at the telegraph operator.

This was thirty-six years ago and Kitty Hawk, N. C., was about the most isolated place anyone would care to find.

(Continued on page 40)

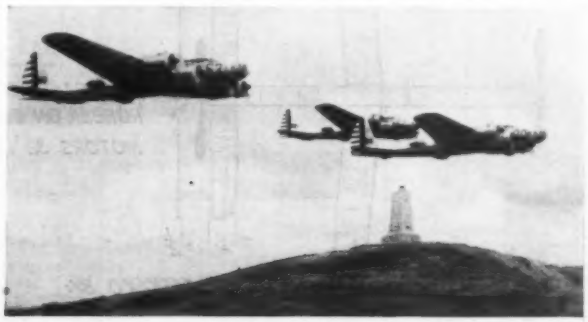


Orville Wright wades into the Miami River to fix vertical fin on an old Wright hydro. (Mayfield)



Orville Wright with a passenger ready to take off in one of the later Wright flying boats

Here is the first photograph ever taken of two airplanes in the air at one time. Taken at Simms Station (Mayfield)

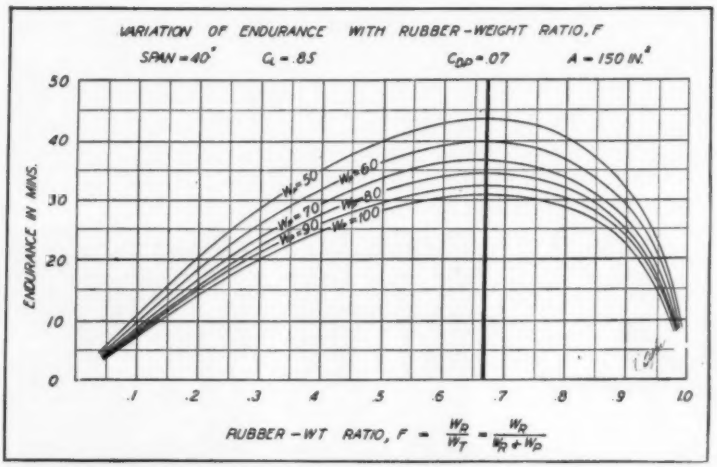


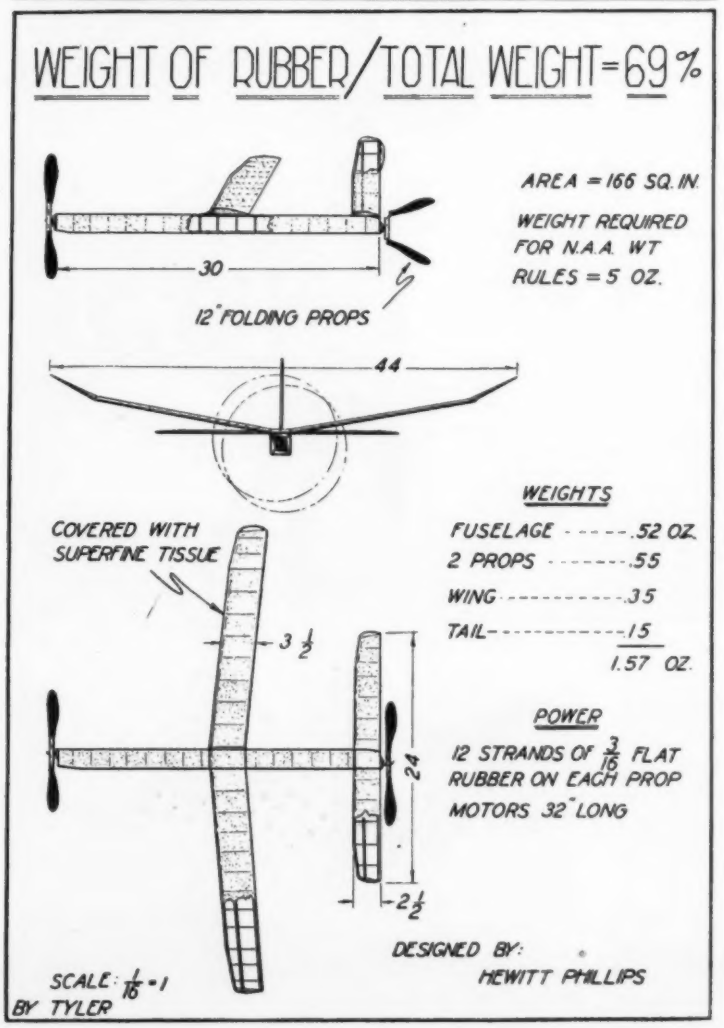
Modern bombers over the Wright Memorial at Kitty Hawk, N.C. on the 30th anniversary of the first military airplane purchase

Thirty Minutes Or Bust!!

By W. HEWITT PHILLIPS

How Design Features Affect the Performance of Indoor Planes and What You Can Do to Improve Their Flight Duration





CLASS will come to order. — — — — — — Last month in the August issue the "prof" derived a formula for the endurance of any rubber-powered model. Easy, wasn't it? This expression gave the duration of a flight in terms of the weight of the rubber, total weight, propeller efficiency and sinking speed.

It provided a convenient means of computing the endurance of a model whose sinking speed had been measured. In case you lost your notes, this is the formula:

$$E = \frac{30{,}000 \times W_r \times N}{W_t \times V_s}$$

where E is the endurance in seconds, W_r the weight of the rubber in ounces, W_t the total weight of rubber and plane in ounces, N the propeller efficiency (%) and V_s the sinking speed expressed in inches per second.

Purpose of this month's session is to show, by means of this formula, how various design features affect the endurance of a model and to work out the design of an indoor model on this basis.

The only way to find how any given factor in the design of a model affects its performance is to hold all other factors constant and investigate how the endurance changes as the feature in question is varied. Several characteristics of a model which may be investigated are suggested by the formula. These are the weight of rubber, weight of model, propeller efficiency and sinking speed.

The sinking speed depends in turn on the model's total weight, wing area, wing span, lift and parasite drag coefficients in normal flight.

Some of these factors may be dismissed from consideration because they are not under the contestant's control. Wing area, for example, is usually fixed by competition rules, and the efficiencies of good propellers are very close to 50% with little possibility of immediate improvement.

The lift and parasite drag characteristics of indoor models can be determined only by wind tunnel tests, and since such tests are not available at present it is not possible to theorize on these factors.

("Hurray!" shout the professor's pupils.)

The remaining characteristics, the weight of the rubber and the weight of the model are, however, directly under the builder's control and may be investigated rather easily on a theoretical basis.

("Oh," groan the students.)

Instead of discussing the weight of rubber, it is convenient to use the ratio of weight of rubber to total weight. Let's express this ratio by the letter F.

Then where W_t stands for the total weight, W_r for the rubber weight and W_p for the weight of plane:

$$F = \frac{W_r}{W_t} = \frac{W_r}{W_r \ W_t} = \text{rubber-weight ratio.}$$

It will be noted that the formula for endurance may then be written:

$$E = \frac{30{,}000 \times F \times N}{V_s}$$

(Continued on page 54)

By CHARLES HAMPSON GRANT

Chapter No. 1—Article No. 3

Fundamentals of Model Plane Design

How the Camber and the Angle of Attack Affect the Amount and the Position of the Lift on Wings

IN PREVIOUS articles of this series, we have considered only single surface wings in our discussions. Such wings are of the type, the under and upper surface of which is approximately parallel and coincident with one another. In fact, the cross section of a single surface wing may be represented by a single curved line such as shown in A Figure No. 7. At B Figure No. 7, you see the cross section of a double surface wing. Such wings have considerable thickness. They also are much more efficient than the single surface type. They do not necessarily give more lift, but the drag or resistance to forward motion is much less. Consequently, the lift drag ratio, or efficiency of the wing is much higher. The air flows around this double surface wing much more smoothly than a single surface one. At A Figure No. 7, you will notice a shaded portion under the wing and immediately to the rear of the leading edge. This represents turbulence, or eddies of air that exists when the air is flowing around the wing. This turbulence causes considerable drag and reduces the efficiency of the wing. As you can see, a turbulence of this nature cannot exist with the properly designed double surface wing as shown at B.

Fig. 7.

Fig. 8.

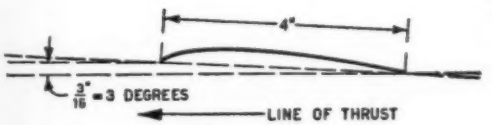


Fig. 10.

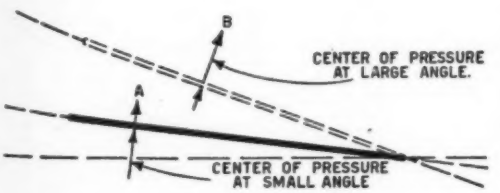


Fig. 11.

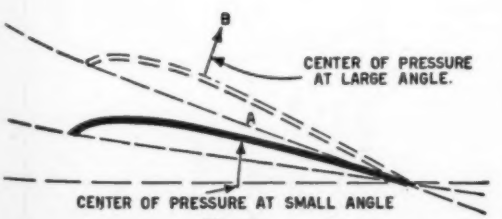


Fig. 12.

One of the chief advantages of a double surface wing is the space between the upper and lower surfaces in which deep wing spars may be placed. The deeper the spar in any wing, provided the spars are of the same width, the stronger they will be. For structural reasons, thick wings are often chosen even though the lift drag ratio may not be as high as double surface wings which are thinner.

In the previous article, we discussed the proper position of the maximum camber, or height of the wing curve. Now let us see how the lift and drag of a wing is affected by the amount of camber used. It may be considered an axiom that the higher the point of maximum curvature of the upper surface is above the cord line, the greater will be the amount of lift generated by the wing. In fact, the lift is approximately proportionate to the height of the curve (amount of camber) at normal flying angles. That is about 3° angle of attack. The same is true of the under surface curvature. Thus, the sum of the lift generated by the under and upper surfaces of the air foil is equal to the total lift on the wing. However, as we have stated previously, the lift generated by the upper surface is approximately equal to 3 times the amount of lift developed by the lower surface.

It has always been a great problem to determine the relative and actual amounts of lift generated by various types of wings, for, as you can readily understand, all wings have not the same cross sectional shape, nor do they have the same lift and drag characteristics.

When anyone wishes to design an airplane, one of the first things he wishes to know is the amount of lift and drag that the wing he may select will generate. The only method, by means of which this has been determined in the past, is through the medium of the wind tunnel. It is very ex-

(Continued on page 30)

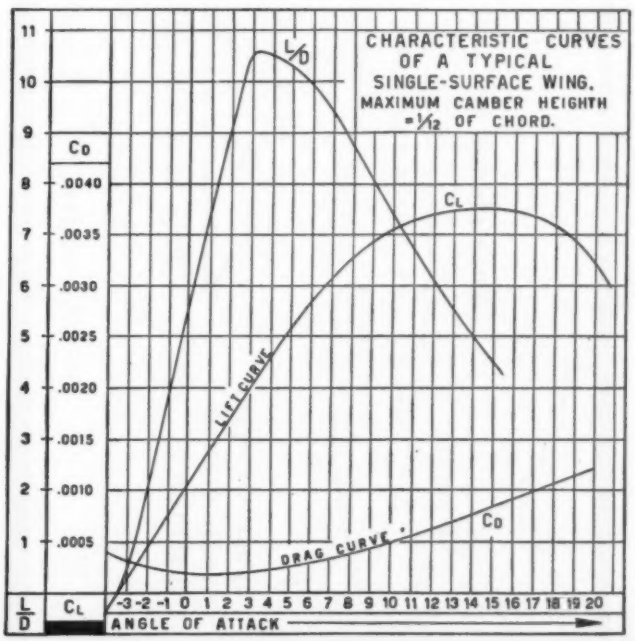
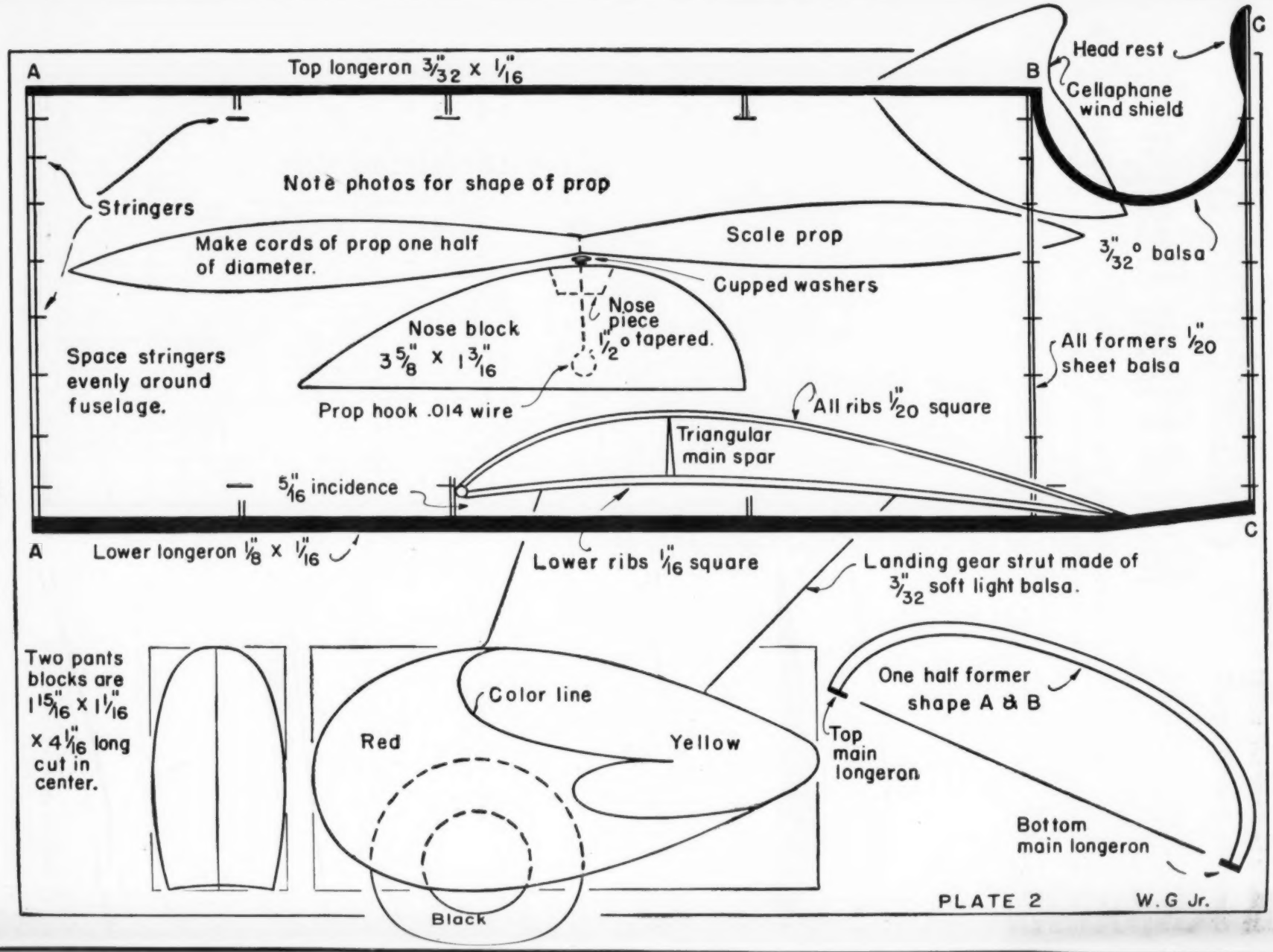
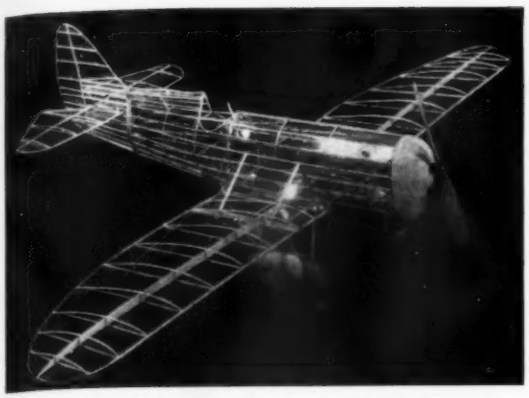


Fig. 9.


A
Top longeron 3/32" x 1/16"
B
C
Head rest
Cellaphane wind shield
Note photos for shape of prop
Stringers
Make cords of prop one half of diameter.
Scale prop
3/32" balsa
Cupped washers
Nose piece 1/2" tapered.
Nose block 3 5/8" x 1 3/16"
Space stringers evenly around fuselage.
All formers 1/20 sheet balsa
Prop hook .014 wire
All ribs 1/20 square
Triangular main spar
5/16" incidence
A
Lower longeron 1/8" x 1/16"
Lower ribs 1/16 square
Landing gear strut made of 3/32" soft light balsa.
Two pants blocks are 1 15/16" x 1 1/16" x 4 1/16" long cut in center.
Color line
Red
Yellow
Black
One half former shape A & B
Top main longeron
Bottom main longeron
PLATE 2
W.G Jr.



The phenomenal plane in startling detail

A FEATHER WEIGHT *GEE BEE* "FLYING SCALE"

Presenting for the First Time A Unique Prize Winning Indoor Flying Scale Model That Is Completely Covered With Microfilm

By WILLIAM GOUGH, Jr.

MOST model builders will remember the popular racing airplane, the Granville "Gee Bee," winner of many famous National Air Races. It was then better known as the "Flying Milk Bottle." Now here is the sister ship of this plane, the "Gee Bee Sportster D," which is an accurate reproduction of the original ship.

The model in this article conforms to the rule that it must be accurately built to the outline dimensions of its big brother in relation to scale, of course. That is, the propeller size or chord, elevator area, etc., have not been altered in any way to suit the model's flying ability. It is impracticable to construct a flying scale model with its complete inner details for indoor competition since the added weight involved is too great a handicap when exceptional endurance is desired.

The following rules and regulations were conceived by members of the Illinois Model Aero Club. These rules have been governing their indoor flying scale contest for many years with great success and interest. The ship presented in this article was built in accordance with them. The first "Gee Bee Sportster D" built by Donald Lockwood about five years ago won the club trophy three years in succession. Don's ship was covered with tissue which is a heavier than microfilm in weight. Since film has less resistance and it is much lighter it has proved to be very successful in regards to its use on indoor scale ships.

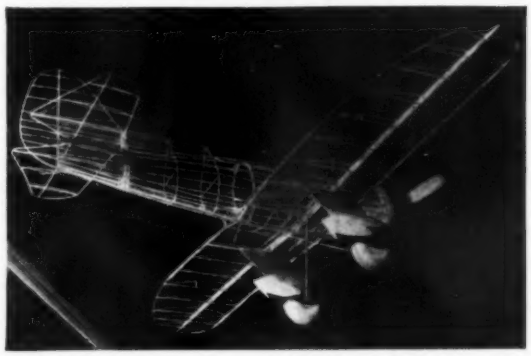
"Flying Scale Model Rules of the Illinois Model Aero Club."

(A) The design of the ship entered must not be more than ten years old. This is to eliminate the desire of members to build old-type ships. This rule compels the entrant to experiment with the modern type of airplane and also to build more models.

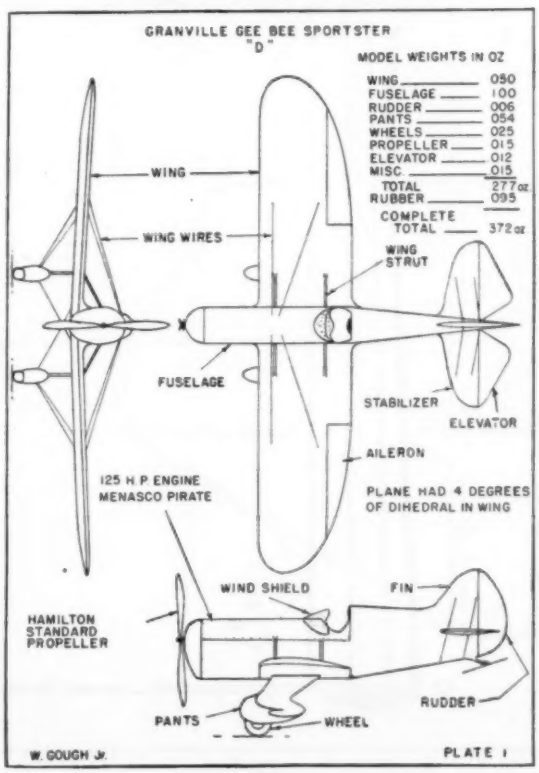
(B) Points are awarded as follows: 50 points for flying; the longest flight declared winner of flying points. 25 points for accuracy. 25 points for neatness, workmanship and detail.

(C) Any model more than ten per cent "off" in accuracy in regards to any part of the model measured is disqualified from the meet.

(D) The propeller blade width or chord must not be more than one-twelfth of the prop overall diameter.



Its performance cannot be over-estimated



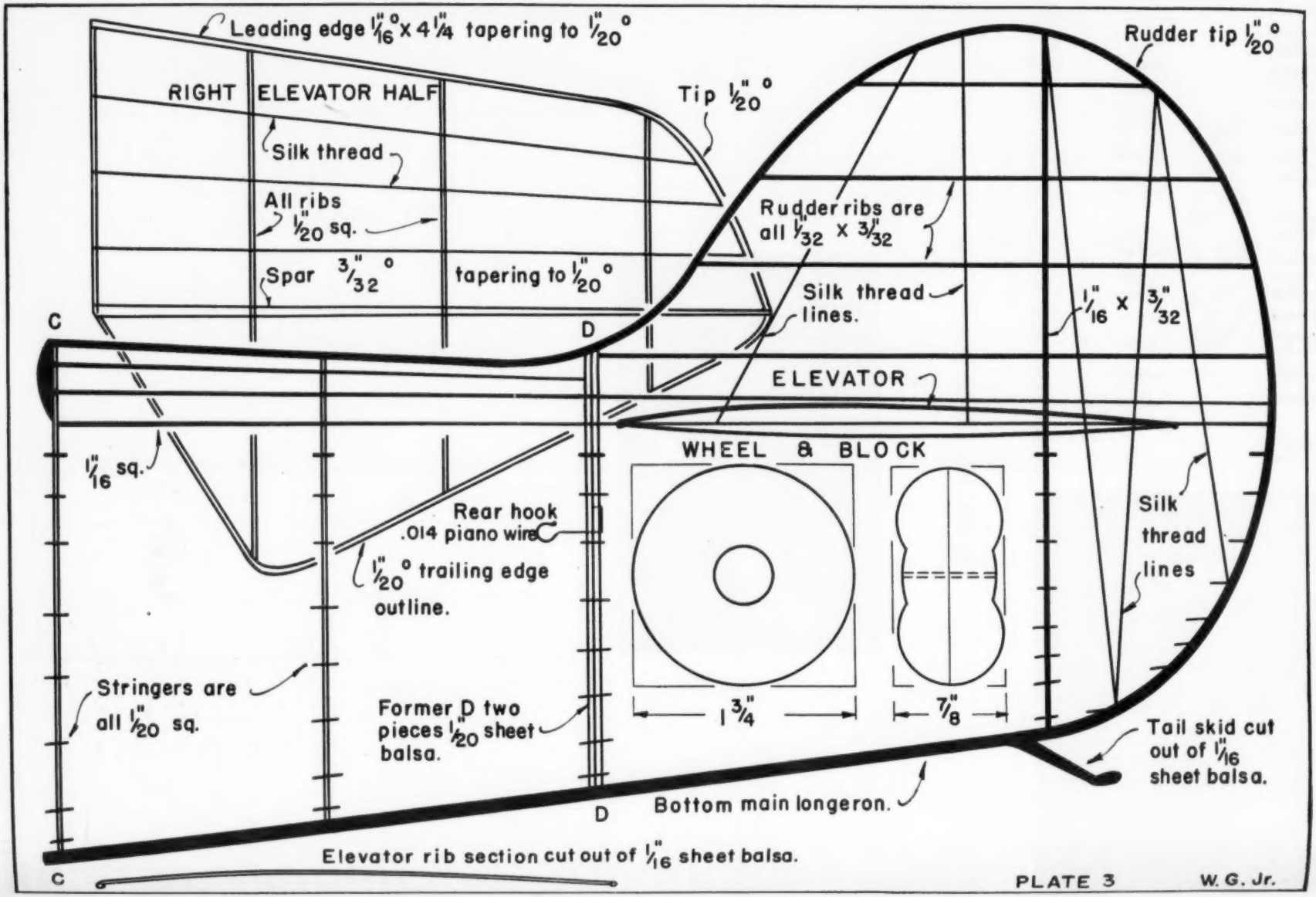
Ten or fifteen measurements are taken and since the builder does not know what they may be he is forced to build his ship very accurately to scale in regards to the original plane it is modeled after.

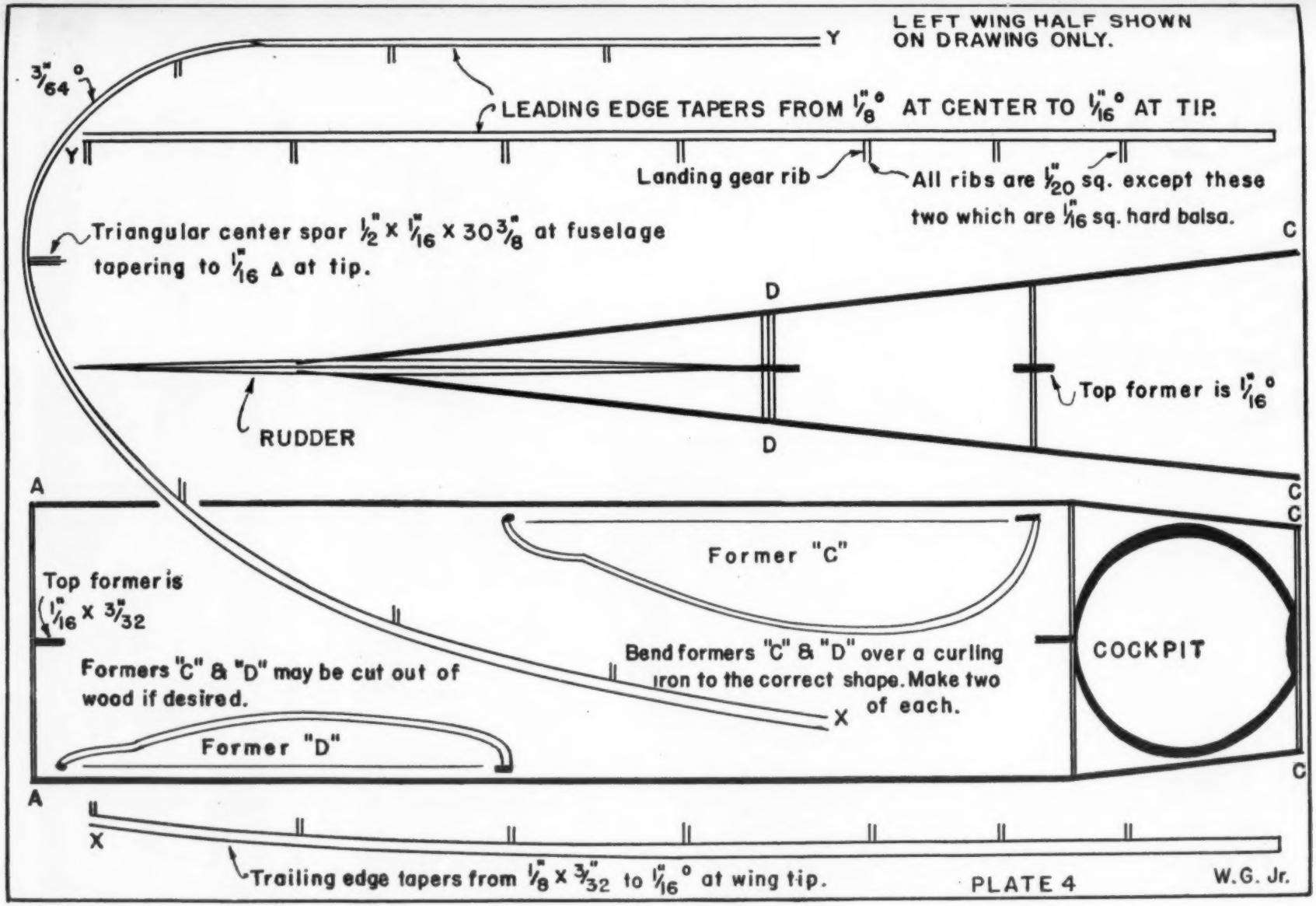
Before beginning construction on this ship, obtain the lightest indoor balsa wood possible. The lighter this job is built the better it will be for flying, provided the strength of the materials used are placed correctly on the model. If in doubt, build the ship a bit heavier at first and as the work proceeds lighten it as desired. To preserve this magazine for future reference, it is best to make a full size drawing of the model. This can be done by using carbon paper or tracing paper to copy from the pages of this magazine.

To begin, the fuselage or body is built in halves. Select a medium sheet of balsa and cut out the three main longerons. The size of the top main longeron is 3/32" x 1/16" x 8". The rear top longeron is 1/16" square, sanded round. A slightly harder grade of wood should be used for this piece. The bottom main longeron is the heavier of the three and measures 1/16" x 1/8" x 18". Sand these pieces slightly to remove the rough edges. Pin these longerons in their proper places as indicated on the drawings.

Next, cut the formers out of 1/20" sheet balsa. Formers A and B are the same shape. Make four halves; two for each side at the nose and cockpit. The formers between A and B are pieced in by later cementing small pieces of wood between the stringers. Then make formers C and D. The formers are about 1/8" wide all around from the top to the bottom of the fuselage. Cement formers A, B, C and D in their places to the longerons. It is not necessary to cut notches in these formers for the stringers since the string-

(Continued on page 58)


Leading edge 1/16" x 4 1/4" tapering to 1/20"
RIGHT ELEVATOR HALF
Silk thread
All ribs 1/20" sq.
Spar 3/32" tapering to 1/20"
Tip 1/20"
Rudder tip 1/20"
Rudder ribs are all 1/32" x 3/32"
Silk thread lines.
1/16" x 3/32"
ELEVATOR
C
D
WHEEL & BLOCK
1/16" sq.
Rear hook .014 piano wire
1/20" trailing edge outline.
Silk thread lines
Stringers are all 1/20" sq.
Former D two pieces 1/20" sheet balsa.
1 3/4"
7/8"
Tail skid cut out of 1/16" sheet balsa.
Bottom main longeron.
Elevator rib section cut out of 1/16" sheet balsa.
PLATE 3
W. G. Jr.


LEFT WING HALF SHOWN ON DRAWING ONLY.
Y
3/64°
LEADING EDGE TAPERS FROM 1/8° AT CENTER TO 1/16° AT TIP.
Y
Landing gear rib
All ribs are 1/20 sq. except these two which are 1/16 sq. hard balsa.
Triangular center spar 1/2" x 1/16" x 30 3/8" at fuselage tapering to 1/16" Δ at tip.
C
D
Top former is 1/16°
RUDDER
D
C
A
C
Former "C"
Top former is 1/16" x 3/32"
Bend formers "C" & "D" over a curling iron to the correct shape. Make two of each.
COCKPIT
Formers "C" & "D" may be cut out of wood if desired.
X
Former "D"
C
A
X
Trailing edge tapers from 1/8" x 3/32" to 1/16° at wing tip.
PLATE 4
W.G. Jr.

FRONTIERS Of Aviation

BY ROBERT C. MORRISON

The new Lockheed Unitwin Vega coming in for a landing with flaps down, powered with a Menasco Unitwin engine

GREAT Britain's new acquisition of the month: the Saunders-Roe Lerwick. It is Great Britain's answer to our Martin PBM-1 twin-engined patrol bomber. However, the English call it a general-purpose flying boat. The Lerwick is about the same size as the Martin with two 1,400 hp. 14-cylinder, sleeve-valve Bristol Hercules engines mounted in nacelles extending forward of the leading edge of the wing. Cooling flaps are installed, and in general it is the usual Bristol installation. However, on this particular ship the nacelle diameter is noticably less than the ring cowl, thus permitting the hot air to flow out the cowl trailing edge rapidly. English-built Hamilton-Standard propellers are in the nose.

Having the smooth lines of Short's Imperial boat, the Lerwick appears as a miniature of the larger planes that are used by Imperial Airways. The airplane has the same contours of the Shorts with the wing fairing into the top of the hull and the fixed wing floats mounted by one set of v-struts to each wing panel. The windshield sets back on the hull and does not form the upper contour of the bow as on the Short Empire boats. The new boats now being built by Short will not have their windshields in the extremity of the bow either. The most important feature of the Lerwick appears to be the hull bottom where a very small step exists slightly more than three-quarters aft, with the rear step almost at the end of the hull. Thus practically the entire bottom area of the hull has contact with the water while on nearly all other boats a good portion of the hull at the tail rises out of the water to lessen "sticking" possibilities during take-off and also to hold the tail out of the spray. If this new Saunders-Roe creation can show good take-off characteristics it will mark a great advancement in the design of flying boat hulls, for with the small step and only a very gradual inclination of the hull aft bottom much drag is eliminated. It is very doubtful if the aeronautical engineer will ever come any closer to the complete elimination of the hull step than as on the Lerwick unless he uses retractable fairing.

The hull is narrow and high and houses gun turrets in the nose, on top of the mid-section and in the tail of the hull just under the trailing edge of the single rudder. Undoubtedly the airplane is very fast and has a long range though we have not as yet received the results of first test flights. It has plenty of power, and the wing is set at a high angle of incidence which will aid its take-off. They are the main reasons why it is possible to design a hull as on the Lerwick.

Short Bros. Ltd. have two new designs that will be

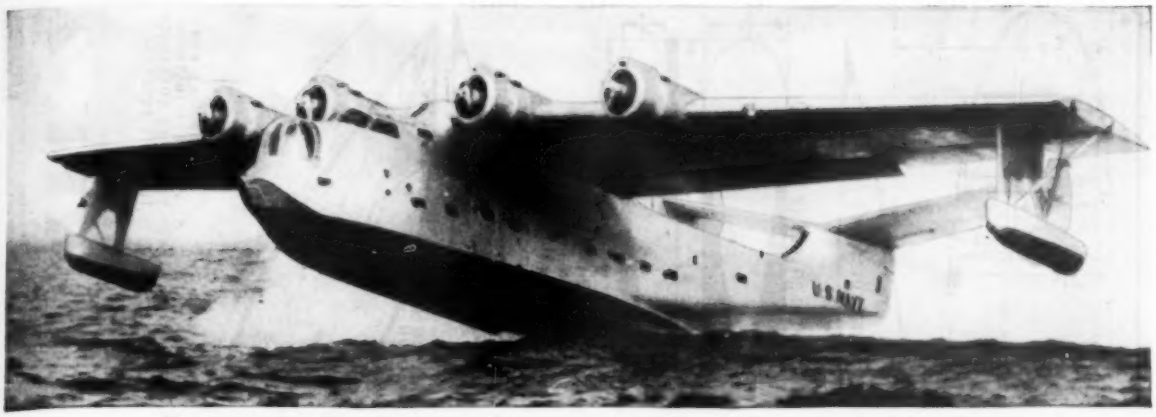
An unusual picture of a squadron of Japanese attack bombers flying in formation on a mission in China. (Acme)

A close-up of the nose of the Douglas B-18, U.S. Army bomber. (Intern'l)

England has made tremendous strides in developing her air power lately. Here is one of her newest bombers. (Monkemeyer)

The "Walrus," British amphibian, landing in a choppy sea. It is the largest plane possible to catapult from the deck of a warship. (Br. P. Comb.)

One of England's newest autogyros giving an exhibition of vertical take-off and landing. (Br. P. Comb.)



The 25 ton Consolidated U.S. Navy flying battleship taking off from a rough sea. (Acme)

out flying this year. Perhaps as this is read the first of the new enlarged Empire flying boats will be going through its paces. The smaller boats built by Short are known as "C" class ships and each of their names begins with a "C." The new boats will be in the "G" class and likewise their names will begin with a "G," the first being "Golden Hind." Three boats of this type are now on order. They have a wing span of 134 ft. 4 in. and a wing loading of 33.3 pounds/sq. ft.! Length is 101 ft. Weights are: Empty, 37,600 lb.; Useful Load, 34,400 lb.; Gross, 72,000 lb.

With four 1,380 hp. Bristol Hercules engines the power loading comes to 13 lb./hp. and a top speed of 205 m.p.h. can be reached. Range for trans-Atlantic operation is 3,200 miles.

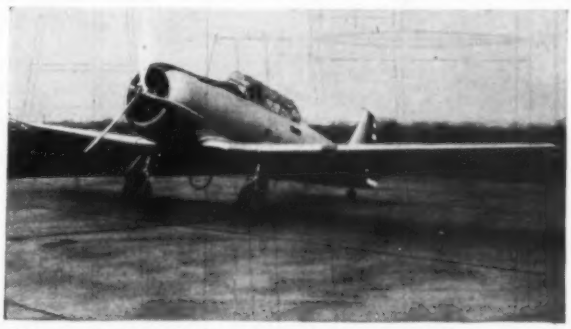
The other new design of Short's will be a four-engined mid-wing landplane, but at this moment, from past experiences, we do not feel safe in predicting whether it will have one, two or three vertical tails. After having passed through the recent tail-changing era when such planes as the DC-4, Boeing 314, D. H. Albatross, D. H. Flamingo and even the little twin-engined Cessna had as many as three different tail designs it is difficult to predict what the proposed Shorts will have at their tail-end the first day they take off. However, at 2 p.m. on the afternoon of April 2, 1939, the general concensus of opinion among Short engineers was that the first landplane would have two vertical tail surfaces at the extremities of a full cantilever stabilizer. Dihedral incorporated in the stabilizer would be featured also.

The fuselage is long and narrow and well streamlined. On the whole the airplane has sleek lines following the conventional trend and gives the engineers reason to believe that their estimated cruising speed of 245 m.p.h. at 10,000 ft. will come true. One thing is certain; the airplane is a huge improvement over the last Short landplane built in 1934, the Short "Syrinx."

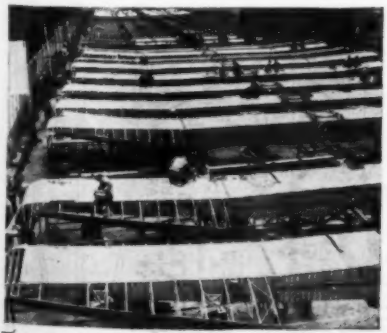
(Continued on page 50)

The U.S. Navy's latest all-metal dive bomber, the Curtiss SBC-4. (Intern'l)

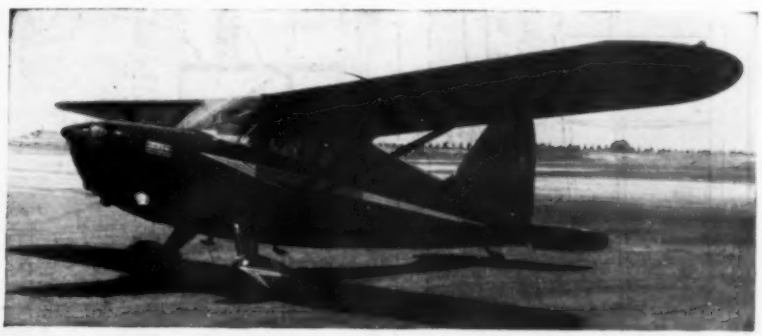
A new Vultee attack plane equipped with the latest and most powerful Pratt & Whitney engine. (Approx. 1800 hp.)



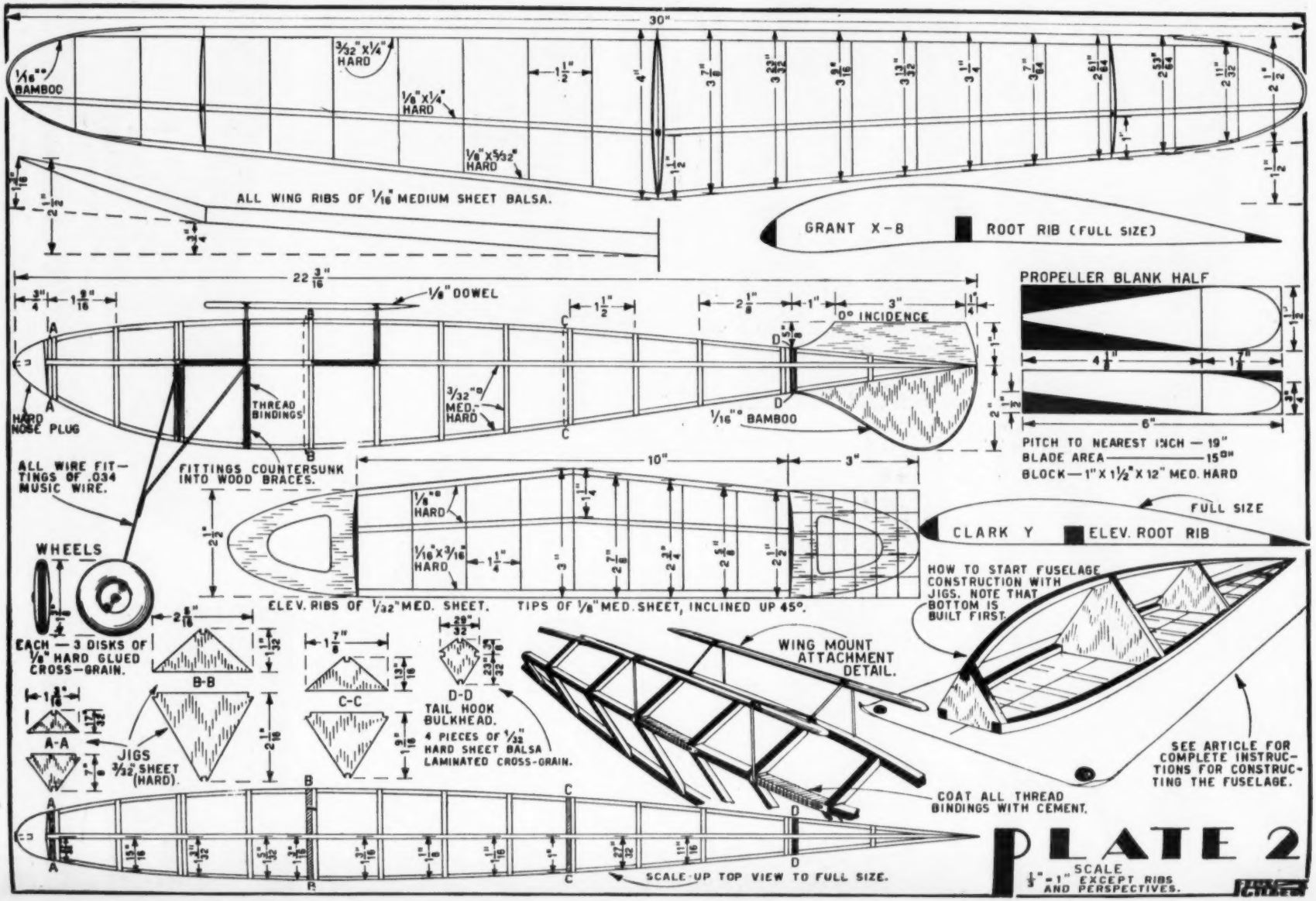
The army's latest basic combat plane; a North American job with a 43 foot wing span. (Acme)



They are really building bombers in quantity in England: View of a production line. (Intern'l)



Here's the new Stinson sportplane powered with a 75 hp. engine. It can carry three people. It is so stable it practically lands itself.


30"
1/16" BAMBOO
3/32" x 1/4" HARD
1/8" x 1/4" HARD
1/8" x 5/32" HARD
ALL WING RIBS OF 1/16" MEDIUM SHEET BALSA.
GRANT X-8
ROOT RIB (FULL SIZE)
22 3/16"
1/8" DOWEL
0° INCIDENCE
HARD NOSE PLUG
THREAD BINDINGS
3/32" MED.-HARD
1/16" BAMBOO
PROPELLER BLANK HALF
PITCH TO NEAREST INCH — 19"
BLADE AREA — 15 SQ IN
BLOCK — 1" X 1 1/2" X 12" MED. HARD
ALL WIRE FITTINGS OF .034 MUSIC WIRE.
FITTINGS COUNTERSUNK INTO WOOD BRACES.
10"
3"
1/8" HARD
1/16" x 3/16" HARD
FULL SIZE
CLARK Y
ELEV. ROOT RIB
WHEELS
EACH — 3 DISKS OF 1/8" HARD GLUED CROSS-GRAIN.
ELEV. RIBS OF 1/32" MED. SHEET.
TIPS OF 1/8" MED. SHEET, INCLINED UP 45°.
HOW TO START FUSELAGE CONSTRUCTION WITH JIGS. NOTE THAT BOTTOM IS BUILT FIRST.
WING MOUNT ATTACHMENT DETAIL.
A-A
B-B
C-C
D-D
TAIL HOOK BULKHEAD.
4 PIECES OF 1/32" HARD SHEET BALSA LAMINATED CROSS-GRAIN.
JIGS 3/32" SHEET (HARD).
SEE ARTICLE FOR COMPLETE INSTRUCTIONS FOR CONSTRUCTING THE FUSELAGE.
COAT ALL THREAD BINDINGS WITH CEMENT.
SCALE-UP TOP VIEW TO FULL SIZE.
PLATE 2
SCALE 1/2" = 1" EXCEPT RIBS AND PERSPECTIVES.

The Baby Duration Trainer

Complete Data From Which You Can Build a Duration Trainer of 100 Sq. In. Wing Area or Contest Models of Larger Size

The completed model gives high performance and is very stable

It is a beautiful climber and does not lose altitude by erratic maneuvers

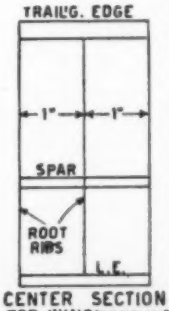
By FELIX GILBERT

IT DIDN'T take this little job long to get used to the ozone. She flew "right off the bat" and has been one of the writers most consistant fliers to date. A steep climb characterizes the ship and the glide couldn't be much more desirable. As an all-weather flyabout that can take a beating and put up a real performance, this is the ship to build; and its construction requires no super experience. The day this plane made its swell 5'3" flight it had rained slightly. The sky was overcast and the writer would not even have thought of flying it except that he promised to meet some friends at the field. At the time the plane was equipped with an experimental 10" propeller, and 14 strands of 1/8" rubber. Without any testing, the plane was given 580 turns and released. A bit of extreme speed was expected and the plane didn't fail us. It shot up to 100 feet, did a complete and perfect loop whizzing down within 10 feet of the ground. The loop completed, it proceeded to spiral up to 300 feet at quite a rate. The sky had now cleared slightly and the plane caught a thermal over the field. With stopwatch in hand and head pointed skyward, the writer followed the plane by walking under it at a normal rate. The wind was negligible and the drift was only about 1,000 feet or less. After flying over a wooded area in the park, the plane finally glided down, being careful to miss every tree except one which it hit head-on about a foot over the ground and two feet from the highway, for which it was headed. Thus a perfect flight was made, a tree saved the model, though clumsily, and there was no damage.

The plane is very graceful in appearance with its taper wing, diamond body, and twin-tip tail which is a variation of the double-rudder type and has been found to work very well. The original was completely covered with tissue, but it is suggested that the builder cover the body with 1/32" sheet as well as the two center wing panels. This will not only improve the looks, but materially increase the strength.

The original plane was designed just as a sport model. Those who want to build it as a contest model need merely build the small extra center section shown on the small plate, and glue it between the wing halves when assembling the model. This will give the wing the few needed square inches of area to bring the model within N.A.A. specifications. The area will be slightly over 100 square inches.

Builders who would like a larger model may scale up the plans. The area will be 150 square inches, by increasing the dimensions shown on the plans by 25 percent. A very simple method of scaling up the plans is to use dividers or proportional dividers. Since the plans are 1/3 actual size, scaling up the reduced drawings four times will give a model with a wing area of 170 square inches.



CENTER SECTION FOR WING (OPTIONAL) INSERT TO RAISE AREA TO 100 SQ. IN.

If the model is to be between 100 and

(Continued on page 36)

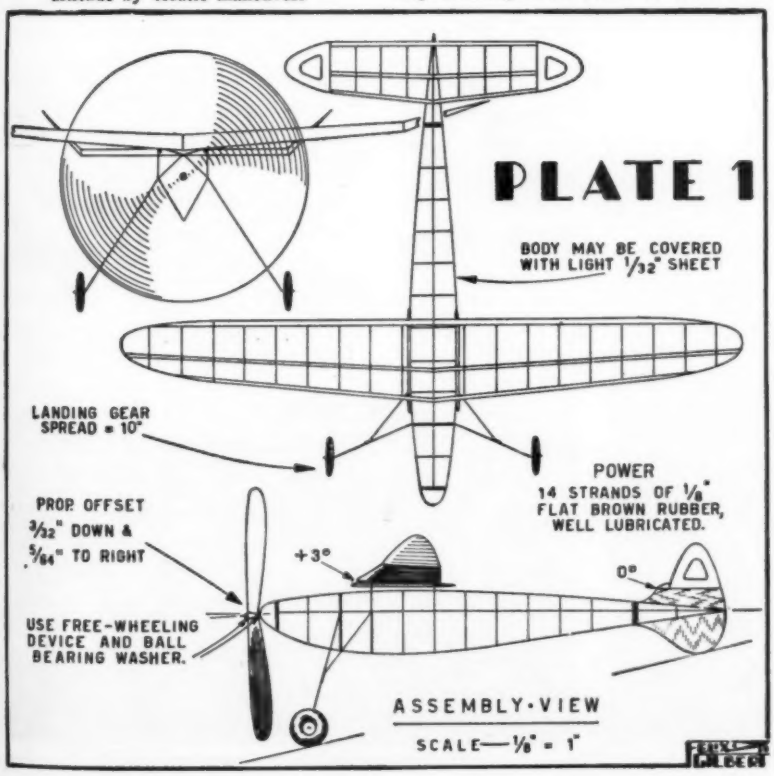


PLATE 1
BODY MAY BE COVERED WITH LIGHT 1/32" SHEET
LANDING GEAR SPREAD = 10"
POWER
14 STRANDS OF 1/8" FLAT BROWN RUBBER, WELL LUBRICATED.
PROP. OFFSET 3/32" DOWN & 5/64" TO RIGHT
+3°
0°
USE FREE-WHEELING DEVICE AND BALL BEARING WASHER.
ASSEMBLY-VIEW
SCALE—1/8" = 1"
FELIX GILBERT

Henry Baker congratulates Robert Toft, Moffett winner

Pict. No. 1. Wm. Allsopp with his twin cylinder, Brown powered "parasol"

Seen At The Nationals

Pict. No. 4. Carl Goldberg with his sensational gas powered skyrocket.

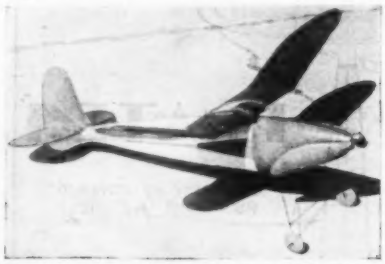
THE Nationals have come and gone and now that the contestants have been able to retrieve the hours of sleep that they lost in the mad scramble to have their planes in tip-top shape for the various events, they are able to pass calm judgment upon the merits and faults of their ships.

In order to preserve an undying record of interesting highlights of the Nationals and the planes which participated, MODEL AIRPLANE NEWS delegated Mr. Harold Kulick to act as its official photographer. Indeed, one of the highlights of the contest was Mr. Kulick's untiring efforts. He presented the appearance, on the field, of being three men. Apparently he was at many remote spots at the same time, judging from the most complete manner in which he covered the meet. All the pictures which appeared in the September issue, as well as the ones in this issue, are the products of Mr. Kulick's conscientious work. Not only does MODEL AIRPLANE NEWS appreciate the manner in which he covered the contest, but we feel that all readers owe him a debt of gratitude for bringing them such an intimate picture of the 1939 Nationals activity.

In this issue Mr. Kulick's pictures give a clear impression of the many and various types of planes that were seen in Detroit and the trophies that were given to the many winners.

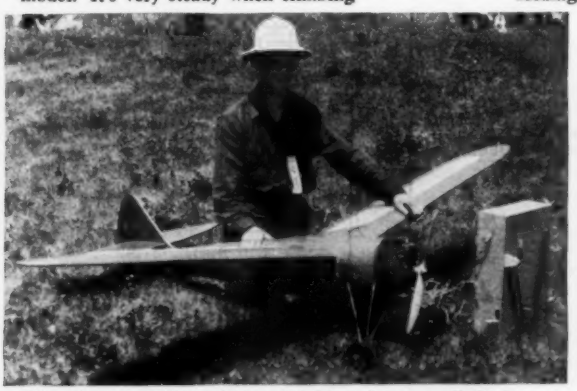
One of the outstanding accomplishments at the Nationals was the winning of the Megow Trophy by the Kresge Aero Club

Pict. No. 5. A parasoled stabilizer rubber model. It's very steady when climbing



Pict. No. 6. A sleek monocoque job with a folding propeller

Pict. No. 7. The curve of the fuselage conforms with the airflow under the wing



Pict. No. 10. Phil Sonheim with his radio controlled plane

Testing the controls of a radio gas model

Pict. No. 3. It has grown a "tumor' 'to meet specifications

Pict. No. 2. Sol Tabi glide testing his Forster-powered gas job

GAS LINES—AIR WAYS

A Preview of Unique Features of Planes and Highlights of the Activities at the 1939 National Contest

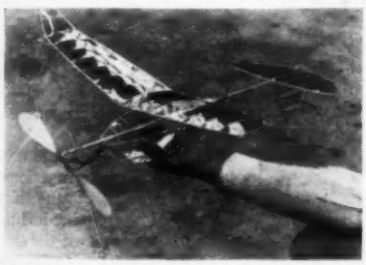
of Newark, New Jersey, of which Mr. Ben Shereshaw is director. This trophy was given to the club represented at the meet which totaled the greatest number of points. The Kresge Club amassed a total of 131 points, 100 points more than those of its nearest competitor. Following is a list of the winners and the places they won:

On one of the following pages a picture shows the Kresge Aero Club boys "bringing home the bacon." In the picture the Megow Trophy rests upon the Official Desk in the Customs Office at the Canadian border. On their journey from Detroit to Newark the club members passed through Canada. Ben Shereshaw and Leon Shulman may be seen awaiting anxiously the verdict of the custom official.

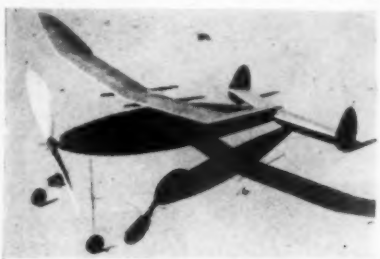
The parasol type of plane appeared to be most popular with the contestants for they were evident on the field in great numbers. A well designed and unique ship is shown in picture No. 1. Here you see William J. Allsopp with his two-cylinder Brown-powered gas job. The engine with which his ship is powered is unique inasmuch as Mr. Allsopp constructed it himself from two Brown "D" motors. He designed and built a new two-cylinder crankcase and applied the cylinder and other parts to it to finish the job. It has tremendous power.

Picture No. 2 shows our old friend, Sol

Trying to laugh away the blues

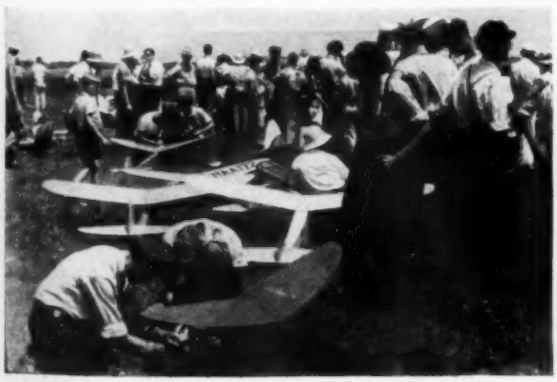


Pict. No. 8. Indoor fuselages are growing fat and stubby, too



Pict. No. 9. A twin rudder rubber job. One of the best designs seen

Designed for super-stability



On the starting line there was continuous activity

Tabi and Raspanti prepare for a "radio flight"

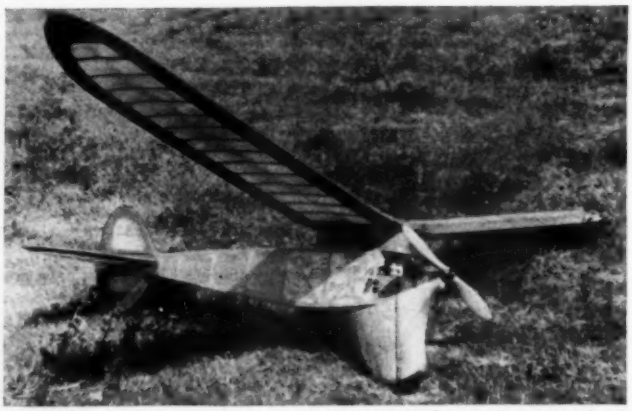
Pict. No. 12. A peg-leg rubber model with a "bulge" over the wing to bring the wing area within requirements of the rules

Joe Raspanti's radio plane in full flight. It captured second place

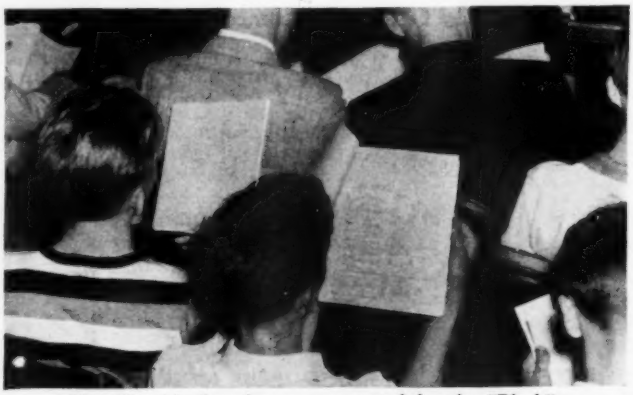
Tabi, glide-testing his ship. Though this ship is of orthodox design, its performance is quite phenomenal. Probably this is due to the careful arrangement of the various design elements.

In picture No. 3 we see the result of a contestant's endeavor to remodel a stick job so it will conform to the fuselage event requirements. The body consists of a good size "egg" with a boom extending clear through it to hold the rubber. After examining the results of ships of this type and of the normal fuselage variety, we cannot help but wonder why contestants will go to such trouble in order to create "freak" designs, which apparently may have a slight advantage over normal types. This apparent advantage disappears into thin air however when the actual flight times of freaks and normal planes are compared. It seems no advantages are gained by such procedure: Such ships only serve as an interesting type of construction.

In picture No. 4 we see our old friend, Carl Goldberg, with his small parasol gas job, which definitely shows the characteristics of indoor plane proportioning. This type of plane predominated at



Pict. No. 11. The latest thing out: Twin cylinder engine, one wheel and with a wing that automatically releases upon impact with the ground



Pict. No. 14. Speeches are renounced for the "Blurb"

the contest, inasmuch as it proved to have the greatest efficiency under the new class-piston displacement rule. These ships were all based upon the design theory that high performance may be obtained by using an engine of high power and building around it a plane having the least possible amount of weight. These little ships were a perfect example of a "motorized skyrocket." They would stick their nose upward and climb in tight spirals for several hundred feet in the short 20-second motor run allowed.

They were exceedingly steady and "produced the goods" as long as their noses could be kept lifted above the horizontal. Apparently on a number of occasions, where the ships flew in a horizontal plane, they whipped quickly into spins, with disasterous results. Carl was unfortunate in cracking up his ship on two occasions, but on the whole their performance was phenomenal.

Basically, these little ships are capable of high performance because of the high power of the engine and the low total weight of the ship.

The Academy rules encourage the building of light

(Continued on page 55)

Pict. No. 13. Louis Garami is well pleased with his "Molecule"

The Atom engine. Note the fly near the spark plug

Messrs. Ohlsson and Rice presenting the Ohlsson Trophy

Members of the Kresge Aero Club bringing the Megow Trophy through the customs

The Megow Model Airplane Co. Trophy

N.A.A. OFFICIAL MODEL AIRPLANE NEWS

ONE of the greatest events of the season has just been concluded in a blaze of glory for America. The Wakefield International Competition was held at Bendix Golf Course, New York, on August 6th. Model builders from England, Canada and the United States competed. French and South African model builders sent their planes which were flown by proxy; they themselves being unable to make the journey to America.

The contest was won by Dick Korda, one of America's foremost model fliers. To the joy of the Americans and the chagrin of the contestants from other countries, Dick, on the very first flight of the contest, kept his model in the air for 43 minutes, 10 seconds. This time not only won the Wakefield Cup for America, but it broke the F.A.I. International record of 33 minutes, 34 seconds, which was formerly held by Mr. Copeland of England.

All those who saw the flight itself conceded that the performance of Korda's model was not due entirely to luck but rather to wisdom gained through long experience. Early in the morning the air was very quiet and very hot. Ground currents were rising. However cirrus clouds overhead indicated the promise of a breeze at any moment. Noticing this, Korda quickly got his plane into the air. Its astounding performance was the result of his wisdom in doing this; for in about an hour a strong breeze did rise which prevented the contestants who flew later from making flights of extended duration. They tried in vain to beat Korda's time but all to no purpose.

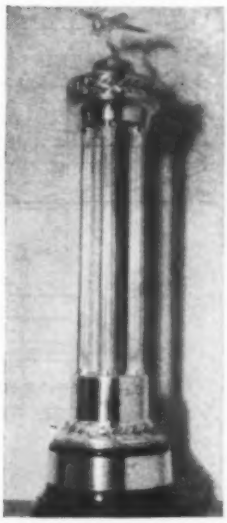
While Korda's plane was in the air, Fred Bowers of the Canadian team realized the air conditions were just right for soaring flight; so he prepared and launched his plane quickly. It soared to great height but came down after a flight of a little over 13 minutes.

Following is a record of the contestants entered and the times they made in the event:

(Cont. on page 59)

Wm. O'Neil Award

The Thomas Bourne Joy Trophy



The award given by the E. G. Budd Mfg. Co.

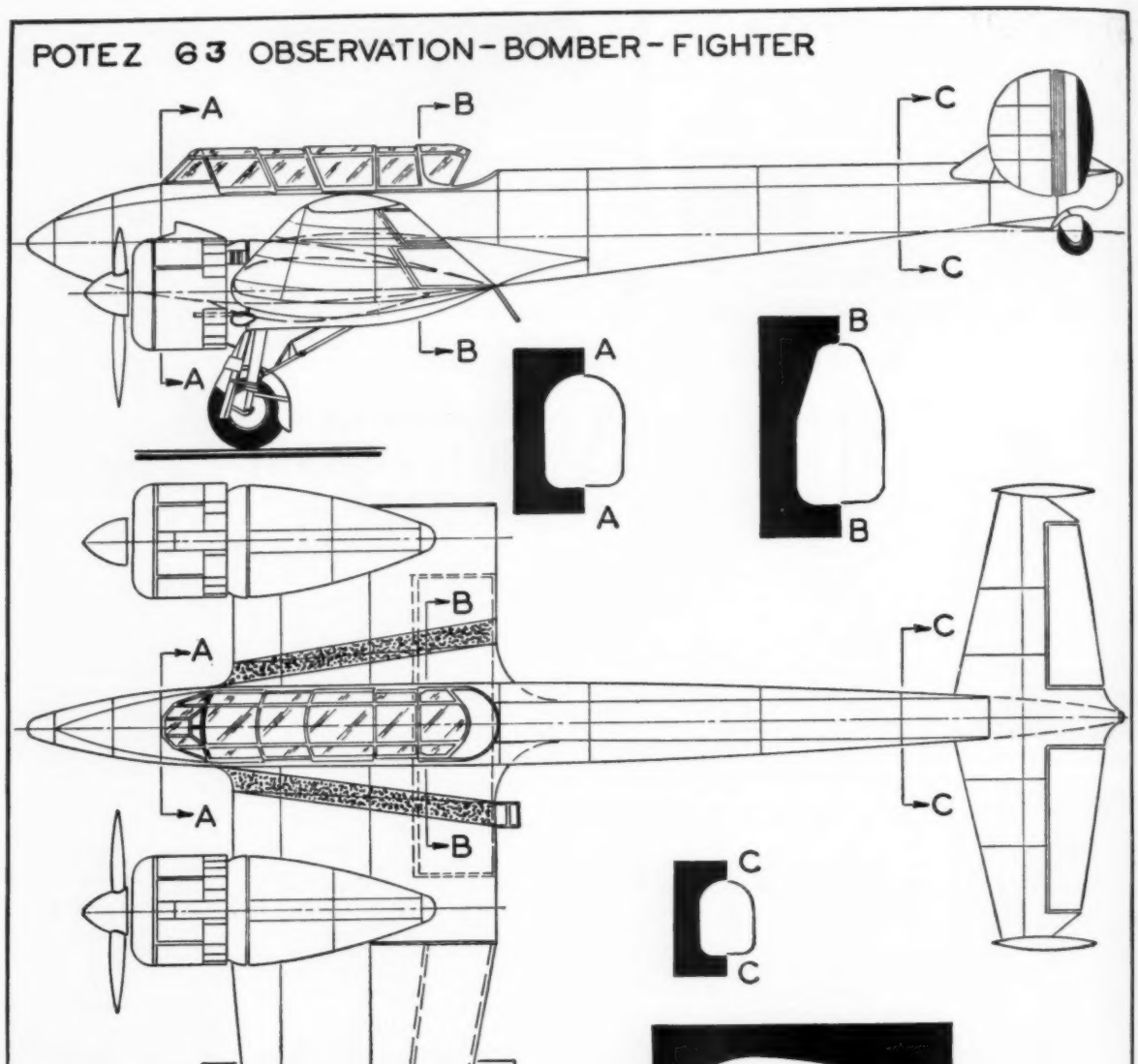
The Paul K. Guillow Award

The Bay Ridge Model Co. Award

The Balsa Wood Co. Trophy

The Peerless Model Airplane Co. Award

The elaborate award of the Ritz Propeller Co.


POTEZ 63 OBSERVATION - BOMBER - FIGHTER
A
B
C
A
B
C
A
A
B
B
A
B
C
C
A
B
C
C
D
D
D-D
SCALE
3/16" = 1'
ROBERT MC LARREN

Falcon of France

THE PLANE ON THE COVER

BY ROBERT McLARREN

IN HIS day Leon Blum was the John L. Lewis of France, but he had no William Green to oppose him and his power was near-absolute over the French workingman. By the Spring of 1936 he had organized the workers of every important industry in France into one vast army of skilled and highly-important laborers. The pulse of the entire land beat with the rhythmic pressure of the hand in which it lay. Without its workingmen no nation can function for there would be no production and no products, therefore no exports, and therefore no increasing capital to fill the national treasury. Seemingly then, the workers control the nation and thus, also, does the leader of those workingmen become the leader of the nation. For the national labor leader has but to tell his men to stop working and the wheels of the nation's industry are halted. And thus is was more by threats than by promises that Leon Blum was swept into power in May, 1936, by the Front Populaire in France.

His reforms, long planned, were sweeping and all-encompassing. And one of the first industries to feel his scythe of power was France's flourishing aircraft establishments. Monsieur Blum decreed that it should function as a single and united industry and not as eighteen individually-owned, controlled and progressive firms. And by his orders the Societe Nationale de Constructions Aeronautique came into being with its six geographical divisions: West, Southwest, North, Central, Southeast and South and on August 11, 1936, the individual firms, so long renown and famed in aviation's history, lost their identity. On that date the French Senate approved the Nationalisation of Military Industries law which gave the government the right to buy or "otherwise acquire" the works, plant, equipment, materials, technical organization, designs and construction rights of firms engaged in the manufacture of military aircraft. By March 22, 1937, the names of Breguet, Loire-Nieuport, Macel Bloch, Bleriot, Potez, Amiot, Hanriot and Farman were no more; in their place were such undignified labels as "S.N.C.A.O.," "S.N.C. A.S.O.," etc., etc.

Under this plan the society has the exclusive right to manufacture in quantity all military designs developed by any single member of the group. This has resulted in Nieuport fighters being built in the Loire-et-Olivier flying boat plant and other such confusing and complicated arrangements. However, each firm is given a free hand in the design of new and experimental types with the society having first call on the acceptance and construction of quantity numbers of them. And in addition, the society has formed an Office Francais d'Exportation de Materiel Aeronautique, which claims the exclusive right to export any planes manufactured within its plants.

The immediate result of this move was a derailed and interrupted flow of machines. This chaotic state of France's aviation industry has grown continually worse until today it is in a simple mess. An attempt was made from the start to standardize tools, dies, machines, jigs, templates and production facilities; even employe classification and wage scales.

Today France is building less planes than any of the seven major nations. And those she is building are objects d'art of the most fantastic types, particularly in the heavy bomber category. Thus it is more with wonder and admiration than satisfaction that we review for you this month the French Potez 63 Reconnaissance-Bomber-Fighter, a startling machine produced under the world's worst manufacturing conditions.

That Monsieur Blum's communistic regime stifled the flow of aircraft production in France is a foregone fact, but that

(Continued on page 48)

Everybody Was There SAYS THE INSTRUCTOR

Speaking of the 12th National Model Airplane Contest, held in Detroit, July 5th through 8th. And if you missed it here's some first-hand notes penciled by the prof himself.

FIRST of all, and as you probably have already heard, 't 'was the biggest national battle ever held . . . and that means the biggest competition for model aircraft ever run off anywhere . . . the number of flights also exceeded all previous marks—there were more than 4,000 recorded.

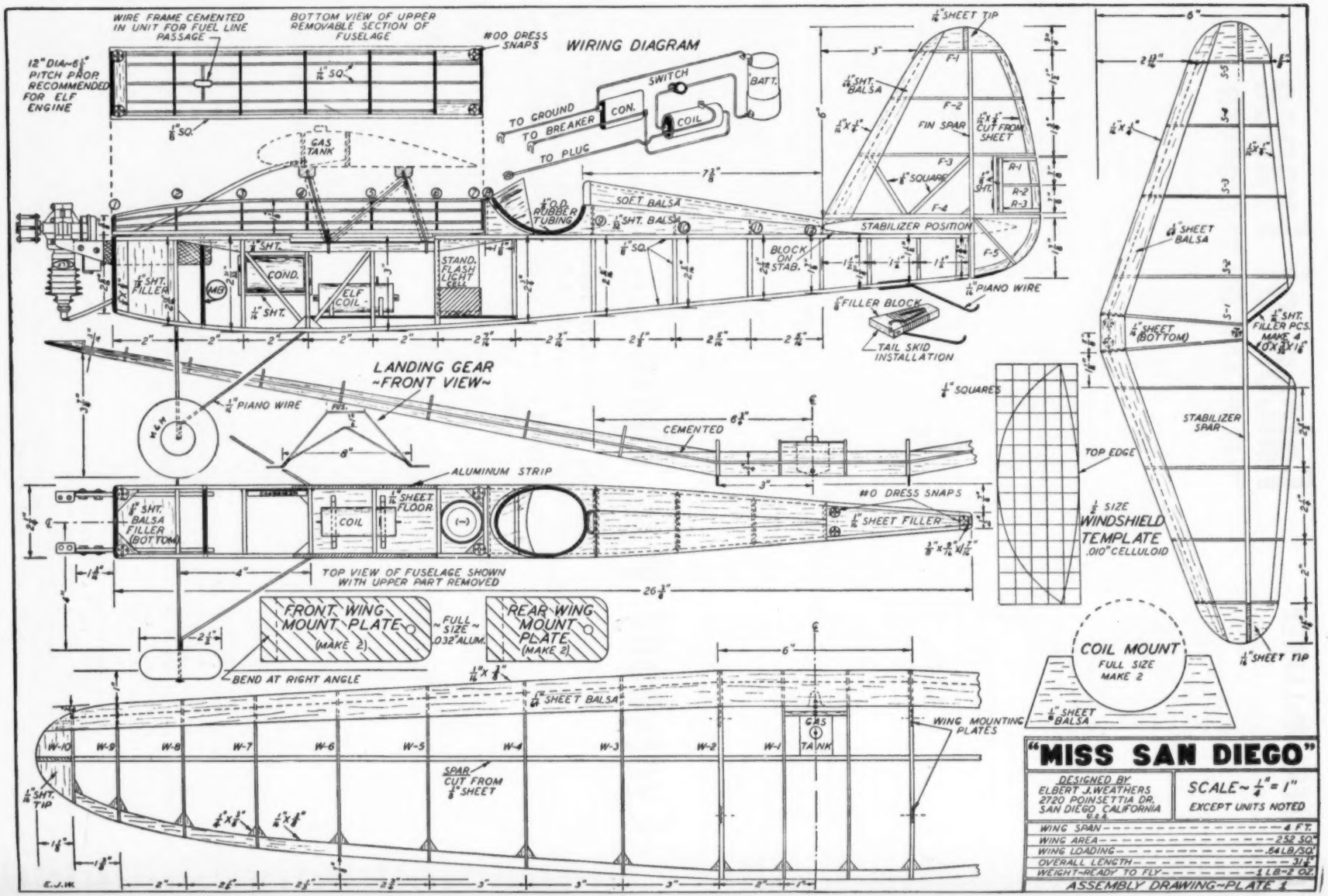
More entrants registered at the official hotel, the Fort Shelby, than in any previous years and the Shelby cooperated handsomely; even providing a workshop on the top floor of its garage where gasoleers could run their engines to their hearts' content regardless of the hour—night or day. "Tent City," established at Wayne County Airport, saw more inhabitants than in previous years and in spite of two terrific downpours, the let's-camp-out-aeromodelers insisted they had a wonderful time; wished you were thar.

A few notes from the Instructor's scratch-pad: streamlined housing for the wheel on mono-wheelers were in evidence outdoors, the designer considering the housing part of the cross-sectional area, of course . . . retractable landing gears, both one and two-wheelers were prominent in the Stout and Moffet competitions. . . . Merrick Andrews of Philadelphia made an unofficial flight indoors of but a few seconds under 24 minutes . . . a remarkable feat considering the many girders and low-ceiling (compared to Lakehurst) for indoor high-times. . . . Andrews' ship had a cantilever stick and a prop with rather wide blades which turned over about 52 times a minute. Hollow wing spars were another feature. It was said Andrews could have put 800 more winds in the rubber motor . . . but he didn't . . . and the ship is still in one piece . . . which seems more important, after all, than wrecking a plane cranking in winds.

Outdoors non-removable tail units were plentiful . . . its proponents claim that the removable type is too easily forced out of adjustment by the tension on the rubber, or on crash landings . . . folding props were extremely successful at the Nationals outdoor events. It was evident that some builders using folding props did not take into consideration that heavy blades would change the center-of-gravity location in a glide (after the blades had folded back). Some of the most successful folding props had quite light blades which cut down this factor somewhat. Ed Lidgard, whose ships you have seen several times in MODEL AIRPLANE NEWS, had about the best folding prop the old Instructor has ever seen. For efficiency in flight and workability when it was time to just fold back and rest, Ed's propeller was accorded top honors.

Smart ideas: Frank Zaic kept his outdoor cabin model wrapped in a damp towel to preserve the rubber agin' the intense heat —his ship was covered in red, white and blue papers lending a very international atmosphere to the competition. "Jeff" Harris of Toronto, who can always be counted upon to do some fine indoor flying, had a very special sort of rubber tensioner in use on his indoor Springfield entry. A loop of 7/64-in. rubber was used to power the ship. After this was wound, a single strand of 3/32-in. rubber, about 3 in. long, was attached to the rear hook and the rear of the powering loop. This acted as a rubber tensioner and resulted in the model coming down "dead stick" on every official flight.

Delegations were found using their own stop-watches to time the outdoor flights . . . when it was found the average flight time was increasing, out rushed all the entrants from the "observing" group to take their flights . . . since conditions were obviously best at that period. Many an outdoor entry in the rubber events was covered with silk or bamboo paper; its users say such strong protective covering permits them to cut down on some of the usual bracing members. Andy Peterson from the West Coast was one of the chaps using silk-covered Stout entries.



"MISS SAN DIEGO"

DESIGNED BY
ELBERT J. WEATHERS
2720 POINSETTIA DR.
SAN DIEGO, CALIFORNIA
U.S.A.

SCALE ~ 1/4" = 1" EXCEPT UNITS NOTED

WING SPAN	4 FT.
WING AREA	252 SQ.
WING LOADING	.64 LB/SQ.
OVERALL LENGTH	31"
WEIGHT-READY TO FLY	1 LB-2 OZ.

ASSEMBLY DRAWING~PLATE 1

A FOUR FOOT WESTERNER

Here's a Little Gas Model that Has Every Desirable Quality—Small Span—Small Engine —Unusual Stability and a Big Performance

It has the appearance of a full scale ship

By ELBERT J. WEATHERS

DUE TO the present trend towards the smaller type gas engine, and the many inquiries as to plans received by the writer in the last couple of years as a result of photos in "Gas Lines" columns, we take pleasure in presenting the data for constructing the small parasol type gas model, "Miss San Diego," which was one of the very first small gas models to be built in the United States and powered with an engine of less than 5/8" bore. The parasoled wing makes the little plane very stable and assures for dependable performance.

The ship performs beautifully with an inverted engine installation. Almost any of the popular small type engines can be easily adapted to this gas job, by merely altering the design of the metal mounting plates, which are located on the wooden beams. Whatever the engine make might be it should be inverted for maximum flight performance.

On several occasions it has flown over fifteen minutes on a forty-second motor run, and has a slow, lazy circling glide after the motor cut. Its flight abilities are most agreeable for contest flying.

It gains altitude quickly with a steep climb

Specifications

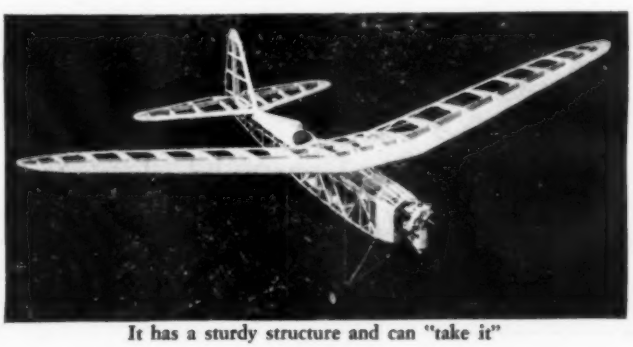
Wing Span	4 ft.
Wing Area	252 sq. in.
Wing Loading	64 lb./sq. ft.
Max. Wing Chord	6-3/4 in.
Overall Length	31-1/4 in.
Stabilizer Span	19-1/2 in.
Overall Height	10-3/4 in.
Tread	8-1/2 in.
Weight, Ready to Fly (With Engine)	1 lb. 2 oz.

Enlarge the drawings to full working size as the first step, making use of the dimensions as given on the assembly drawing. All the balsa used is to be of firm medium-hard variety, unless noted otherwise.

Fuselage

Begin the construction with this unit. Build two side frames of 1/8" square balsa, using wood which is very firm, especially for the longerons. Fillers of 1/16" sheet are put in each frame at the front. Build the frames together in the usual way, pinning each up-side-down on the work table. When all 1/8" square cross bracing is cemented in place, cut a piece of balsa size 3/8" x 9/16" x 1-7/16", which is the tailpost and which is installed next. All fuselage formers are of 1/16" sheet balsa except No. 1 and No. 9, which are 1/8" thick. Locate the positions for fuselage formers No. 8 to No. 12 inclusive, and cement each in place.

The top, forward, removable section of the fuselage is assembled next. Lay the two 1/8" square longerons down, followed by formers No. 1 to No. 7 inclusive. Place the top center 1/16" square stringer first, followed by the remaining four. Cut and cement in place the 1/8" sheet balsa pieces upon which the No. 00 dress snaps are mounted on the removable section. The balsa strips for the fuselage frame, to receive the other half of the dress snaps, may be installed at the same time. Using metallic cement, secure the light halves of the four snaps in place on both the fuselage and removable section, making sure that all are in perfect alignment.



It has a sturdy structure and can "take it"

Now cut two strips 5-7/8" long and 1/8" wide from 1/32" sheet aluminum and cement them on the top fuselage longerons, where stepped down and where wing support slides. The main switch, of the small button type, and the booster plugs should be installed on the right side of the fuselage at this point. Next cut the rear motor beam anchorage bulkhead from 1/8" sheet balsa, as shown. Place it on with ample cement. The 1/32" balsa sheet can now be applied from formers No. 8 to No. 12.

The outline of the cockpit is penciled on a sheet size 3-1/8" x 3-5/8" x 3-3/8" long, which is applied between formers No. 8 and No. 9. The cockpit is cut out after the sheet is cemented and dry. Proceed to finish by cutting a piece 1-1/4" x 3-1/8" x 7-1/8" long from the 1/32" stock size, applying it in the same manner, between formers No. 9 and No. 12. Cut lengthwise through one wall of a length of 1/8" O.D. diameter rubber tubing and lay it, using cement, around the cockpit edge to form the combing. The head-rest is carved from soft balsa and should be hollowed out. The block is 3/4" square at the cockpit, 1/8" x 1/4" at the rear end, and is 7-1/2" in overall length. Cement it in position.

Using the template provided in the plans, cut the windshield from the celluloid specified, but do not install it until after the model is covered and painted.

The landing gear is formed from 1/16" piano wire. First make the front side frame, followed by the rear side frame and the center shock strut. Cement two cross braces on the fuselage bottom, each size 1/8" x 1/2" hard balsa, to receive the landing gear. Use ample cement to bind each landing gear frame to these and also be sure that both balsa mounting strips are well braced with gussets and cement at the lower fuselage longerons. Heavy thread and metallic cement render a satisfactory and permanent job of securing the landing gear to the fuselage. To finish it, bind all three frames together at the axle with fine copper wire and solder well. The tail skid is formed from a length of the same wire used for the landing gear. It is installed where shown.

Make the firewall from 1/8" plywood of good quality. It is 2-1/4" x 2-5/16" in size. Cut the motor beam and wiring holes and then install it against the end of the fuselage frame, using a common butt joint and plenty of cement. Follow with the motor beams, which are 1/8" x 3/4" x 4-1/4" in size. They should be cut from black walnut, maple, or some similar hardwood having the necessary shock-absorbing qualities. Make the two engine-mounting plates from 27-gauge galvanized sheet metal and install each on the wooden beams as shown, using 6-32 steel or brass machine screws and nuts. The wooden beams can now be shoved through the firewall and rear anchorage bulkhead and securely cemented in position, making sure that each are parallel to the top longerons of the fuselage.

Install the coil, condenser and battery holder where shown. The battery holder is of simple sheet brass construction. See drawings for this detail. Complete the fuselage by wiring everything with fine, stranded-and tinned-insulated wire, using the diagram provided.

The wing strut unit, or cradle, which supports the wing, should be constructed next. It is formed from the same wire as used for the landing gear. Begin by forming two end frames, as shown. It will be noticed that each are to be bent with a narrower spread at the tip ends than that of the fittings on the wing center section, as the cradle thereby needs to be only sprung apart to drop the wing between it, to secure it for flying. The two diagonal side braces are formed and soldered to the end frames, the joints first being bound with fine copper wire. Be certain that the frame is in perfect alignment, before soldering. To complete it, apply 1/16" x 1/4" balsa strips to each side of the struts, routing out channels for the wire and soldered joints and cementing the two halves together over the wire. Sand the balsa struts (now 1/8" thick) to streamlined cross section and cover them with tissue later on, when the model is covered, to insure for a good finish.

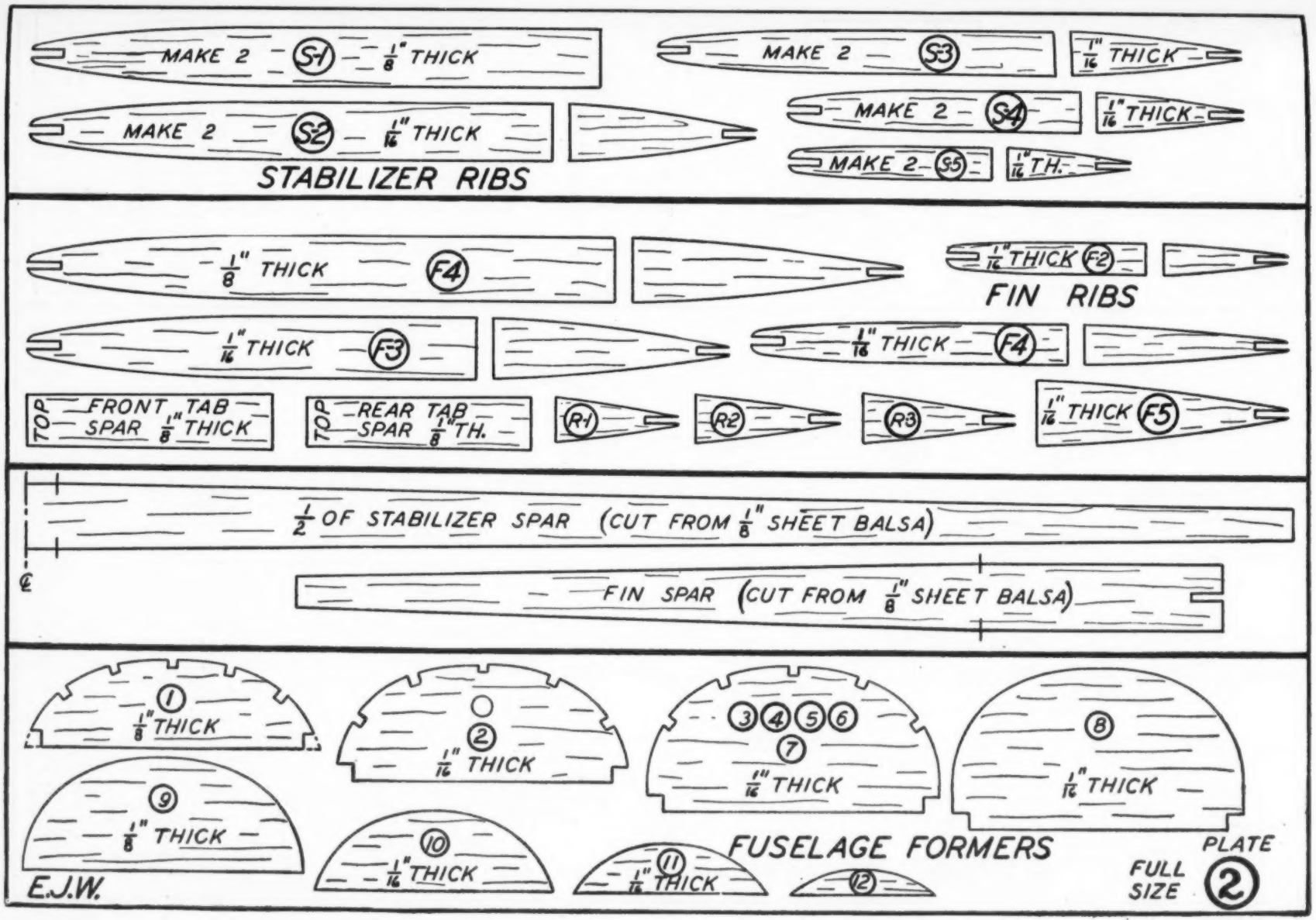
Wing

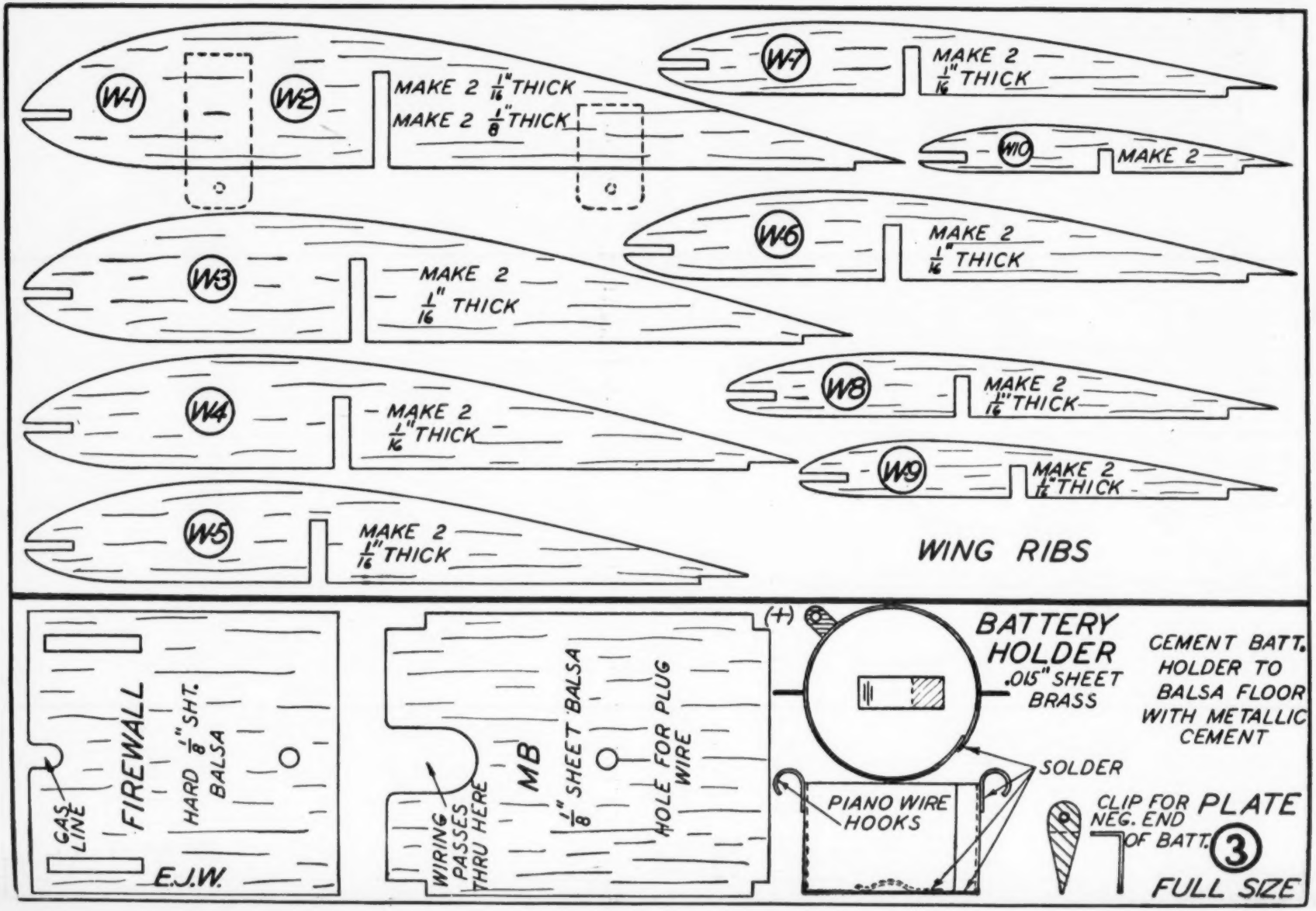
The ribs are all of 1/16" sheet balsa, except ribs W-2, which are of 1/8" sheet balsa. Both the leading and trailing edges are cut from 1/16" sheet balsa, and are of 3/8" width. Each consists of three parts, as the center section of the wing is constructed first, although the wing is a one-piece unit when completed. The wing spar is built up from three pieces, as shown in the plans, and is cemented together as one piece before being laid down in building the center section. Each wing tip is 1/16" sheet balsa. The balsa veneer leading edge covering is prepared after basic construction is completed.

To build the wing, first construct the center portion by pinning into position the leading and trailing edges, and the spar. Raise the leading edge 5/16" from the work table. Wing ribs W-1 and W-2 are now cemented in position. (If an engine having a suction feed and therefore close-coupled tank is to be used, the brass gas tank, and its installation in the wing center section can be disregarded.) The fuel tank and wing strut fittings are installed later.

When dry, remove the wing center section construction from the work table and lay down the spar on either side to proceed with the right or left wing panel. Pin the leading and trailing edges in position and after raising the leading edge 5/16" at the inner end and 3/32"

(Continued on page 46)


MAKE 2 S-1 1/8" THICK
MAKE 2 S-2 1/16" THICK
STABILIZER RIBS
MAKE 2 S-3 1/16" THICK
MAKE 2 S-4 1/16" THICK
MAKE 2 S-5 1/16" TH.
1/8" THICK F4
1/16" THICK F3
TOP FRONT SPAR TAB 1/8" THICK
TOP REAR SPAR TAB 1/8" TH.
R-1
R2
R3
1/16" THICK F2
FIN RIBS
1/16" THICK F4
1/16" THICK F5
1/2 OF STABILIZER SPAR (CUT FROM 1/8" SHEET BALSA)
FIN SPAR (CUT FROM 1/8" SHEET BALSA)
1 1/8" THICK
2 1/16" THICK
3 4 5 6 7 1/16" THICK
8 1/16" THICK
9 1/8" THICK
10 1/16" THICK
11 1/16" THICK
12
FUSELAGE FORMERS
E.J.W.
PLATE
FULL SIZE 2


W1
W2
MAKE 2 1/16" THICK
MAKE 2 1/8" THICK
W7
MAKE 2 1/16" THICK
W10
MAKE 2
W6
MAKE 2 1/16" THICK
W3
MAKE 2 1/16" THICK
W8
MAKE 2 1/16" THICK
W4
MAKE 2 1/16" THICK
W9
MAKE 2 1/16" THICK
W5
MAKE 2 1/16" THICK
WING RIBS
GAS LINE
FIREWALL
HARD 1/8" SHT. BALSA
E.J.W.
WIRING PASSES THRU HERE
MB
1/8" SHEET BALSA
HOLE FOR PLUG WIRE
(+)
BATTERY HOLDER
.015" SHEET BRASS
CEMENT BATT. HOLDER TO BALSA FLOOR WITH METALLIC CEMENT
SOLDER
PIANO WIRE HOOKS
CLIP FOR NEG. END OF BATT.
PLATE 3
FULL SIZE

FLASH-NEWS

SPECIAL TO MODEL AIRPLANE NEWS:

By Robert McLarren

ORDERED by United Air Lines: six 42-passenger 33-ton Douglas DC-4 "Super Mainliners" at a cost of approximately three million dollars. Construction on the huge ships will not begin until May, 1941, as traffic will not warrant their use until then. Brings to 14 the total orders on hand.

The blowout of both tires brought to a hasty end the projected New York to Palestine flight of Alex Loeb and Richard Decker at Floyd Bennet Field, New York. The cabin monoplane was badly overloaded which caused the mishap. They were not licensed to make the attempt.

President Roosevelt signed a bill authorizing the War Department to spend $293,895,547 on new fighting planes, which will bring the entire rearmament program to 5300 new airplanes by July, 1941. The Air Corps will get 2290 new ships (other than those already on order), the National Guard: 177.

British Air Minister, Sir Kingsley Wood was badly shaken up in the crash of a high-speed long-nosed Blenheim on July 28th. Along with the RAF's two highest ranking officers, the Cabinet member was treated for bruises resulting from a forced landing near Kirby-in-Furness, England.

Three Lockheed employees of the company's Liverpool reassembly plant, where 250 Bombers are received and prepared for the Royal Air Force, were killed and burned beyond recognition in the fiery crash of a Lockheed Hudson Bomber on the bank of the River Dee near Liverpool, July 28th. Pilot Frank Anderline, Mechanic Fred Taylor and Inspector John Hagadorn all of the West Coast, were the victims of the crash resulting from the huge bomber losing a wing soon after taking off from Speke Airdrome.

Varying in ages from 16 to 61, there are 761 licensed women pilots in America according to recently released figures. This is nearly double the 1937 figures. Only 70 of them are transport licensees.

Aircraft manufacturers have been instructed to immediately weed out all aliens working on warplanes being built for the army or navy. A 1926 law forbids their employment on military contracts but large scale hiring of personnel recently has fostered a lax tendency among personnel offices.

Los Angeles will become a port of call of the huge Boeing Clippers when final plans for the Southern Pacific route are completed. Long-sought, the big ships will fly from Alameda to Los Angeles to Honolulu and thence southward.

Plans for a Los Angeles-to-Nome airline are nearing completion with the forging of the last link: Great Falls, Montana to Lethbridge, Canada scheduled soon. From Nome plans are under way to continue the route southward to Tokyo and join Pan American lines at Hongkong.

England's big 15-ton Consolidated PBY Flying Boat arrived safely in Felixstowe after a two-stop flight from San Diego, where it was built. Will be tested by Royal Air Force.

Douglas' long-awaited B-23 Bomber took to the air on its maiden flight July 27th with Major Carl Cover, vice-president and chief test pilot at the controls. The long, sleek twin-engine bomber is powered by two 1450 horsepower Wright 14-cylinder double-row radials and features a tail gunner, first used in modern American bombers. The Air Corps has placed a preliminary order for 38 of them at a cost of $5,266,420.

The Air Corps' new Boeing B-17B Bombers proved their salt when one of them went aloft at Langley Field on July 24th and landed with three new national weight and altitude records. With Lieut.-Col. Robert Olds at the four throttles, the ship climbed to 23,800 feet with a load of five thousand kilograms (11,023 pounds). Records were also made with 2000 and 1000 kg. loads.

For development work with the Air Corps' Lockhead XC-35 Stratosphere ship, Major Carl F. Greene and Captain Alfred H. Johnson were awarded the Soldier's Medal for Extraordinary Achievement on July 25th. For developing and testing the Air Corps' Wright Field blind-landing system, Captain Carl J. Crane and George V. Holleman were similarly honored.

The Army Air Corps celebrated its 30th birthday August 2nd, with the flight of more than one thousand fighting planes from various stations and bases throughout the nation. On that day, 1909, Brig. Gen. James Allen formally approved the purchase of a Wright "flying machine" and construction began. Top speed (1909): 42 miles per hour. Top speed (1939): 420 miles per hour.

German and French Air Lines will inaugurate passenger service over the South Atlantic in October cutting the time from Berlin and Paris to Buenos Aires from three weeks to four days. Air France and Luft Hansa have carried regular air mail over the route since February, 1934, and will now operate two round trips weekly.

The Curtiss Propeller Division has announced the successful completion of tests at Wright Field on the world's first four-bladed controllable pitch propeller. For use on high speed bombing and fighting craft, the design is thought necessary in order to absorb the tremendous power of recent two thousand plus horsepower engines. Propeller diameter and speed is thus kept to a minimum eliminating high, heavy landing gears and anti-torque and vibration mechanisms.

Hunter and Humphrey Moody, Springfield, Ill., brothers went aloft on July 23rd determined to break the light-plane endurance record of 218 hours. Hunter Moody failed in a similar attempt last month with Wilbur Parrish.

Timm Aircraft Company of Van Nuys, California, has purchased the original model, jigs, tools and manufacturing rights to Howard Hughes' sensational racing monoplane which set a new world's speed record of 352.38 miles per hour in 1936. Officials refused to divulge plans for the future of the ship.

Three long-distance flights are under preparation at Los Angeles each to scattered parts of the world. Major Maurice Rossi, French Army reservist who set a 5658-mile non-stop record from New York to Syria in 1933, will soon take-off from the far-west port in a projected Los Angeles-Djibouti, French West Africa, attempt. Howard Hughes, perennial mystery flyer, is readying his big four-engined Boeing Stratoliner for a crack at his own round-the-world mark, this time in a one-stop attempt. Japan's "good-will" Mitsubishi "Otori" twin-engined monoplane will attempt a Los Angeles-Tokyo flight soon.

Commander James C. Monfort "Naval aviator No. 35" has been placed in command of Reeves Field, San Pedro, California, after having served as commander of the new U.S.S. Enterprise, which he fitted out and placed in commission. He earned his wings in 1915 and is one of the navy's oldest flying officers.

In an abrupt about-face, President Roosevelt asked Congress for $300,000 to begin construction on a two million dollar dirigible plus authority to enter into contracts for $1,700,000 more.

Nine Italian Army aviators were killed in the mid-air collision of two Savoia-Marchetti S-79 tri-motored bombers on July 1st. The crash occurred during maneuvers near Viterbo and one of the officers was a Lieut. Col. of aviation. No names were divulged.

What at first appeared a major naval catastrophe later turned out to be only an insignificant incident when a lighted cigarette was dropped into the gasoline soaked water beside the navy's thirty million dollar aircraft carrier "U.S.S. Ranger." At first reported as having demolished the giant ship by over-enthusiastic pressmen, the total damage was officially reported as being only $3000, mostly paint!

Mrs. Clara Adams, modern Nellie Bly, circumnavigated the globe by air in 16 days, 19 hours and 4 minutes to set a new world's record for the event. The wealthy New York City socialite is a confirmed first flighter having been on the first Atlantic trip of the Graf Zeppelin in 1928, the maiden flight of the Hindenburg in 1936 and on the giant Dornier DO-X, twelve engine monster on its first flight from Rio de Janeiro to New York.

The V-164, twin-engine Hall PH-2 Coast Guard flying boat crashed and sank at sea carrying three crew members to their death on July 15th. Shortly after removing a stricken seaman from the survey ketch Atlantis, 150 miles southeast of New York City, it took to the air and when only twenty feet in the air was literally plucked out of the sky by a huge wave and dashed to the surface. Five other members of the crew,

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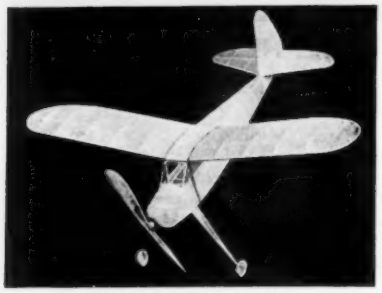
THE WORLD OVER

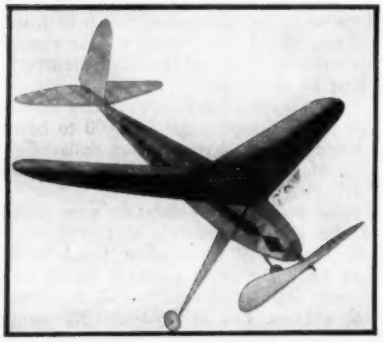


30 in. PACIFIC ACE

A practical and durable commercial model. Easily constructed from well drawn and detailed plans. Kit contains an ample supply of first grade wood and high quality cement. Comparable with and out-flies most dollar kits.
Add 10c for Postage..... 25c

CLOUD HAUNTER, 40 in. model, same ship, add 10c postage..... 50c

W. R. Butterfield of Los Angeles made a flight of 2 hours and 40 min. with his Cloud Haunter.



RECORD WRECKER

54 and 49 minutes—consecutive flights

Newest Modelcraft Sensation! With a 26" span the Record Wrecker includes free-wheeling unit, rubber lube, contest rubber, best quality balsa, cement, dope and large full size plans.
Add 10c postage..... 50c

SEVERSKY P 35

This ship is said to do over 300 m.p.h. Kit has turned cowl, hard wood prop, cement dope, trim color, and easy to follow plans. You will like this ship.. Wing span 24 inches. **Add 10c Postage..... $1.00**

NORTHROP A 17

This high speed attack plane is known to all interested in planes. 24" accurate model. **Add 10c Postage..... $1.00**

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two with broken backs, struggled free and were picked up by the Atlantis.

The world's first rooftop autogiro service was officially inaugurated July 6th with the first scheduled flight of TWA's post-office-to-airport service from Philadelphia's new postoffice building to the Camden Airport six miles away. The round trip took 15 minutes, takes an hour by truck.

Lindbergh Field, San Diego, home of Ryan, Consolidated, Army, Navy and Coast Guard bases was voted a $750,000 appropriation for improvements on July 15th. New runways, lights, and land filling was begun immediately.

Six thousand flyers received their pilots license in the last year according to recently released CAA figures. There are now 26,-144 pilots and 11,160 aircraft licensed in the United States.

United Airlines latest technical achievement: a visual cone of silence in which red lights flash on when the ship is directly over a radio sending station. This replaces the usual silent beam which had many disadvantages.

(Continued from page 55)

Fundamentals of Model Plane Design

(Continued from page 9)

pensive to run tests for lift and drag on any particular wing and is usually beyond the financial scope of the average model-builder. The only recourse that he may have is to obtain information concerning the wing characteristics from wind tunnel reports on the particular wing which he wishes to use. These are often difficult to obtain, and in fact, are not available at all in many cases. Consequently, it becomes imperative to develop some means of calculating the approximate amount of lift that any air foil will generate without the necessity of determining this data from the wind tunnel. A simple system involving the amount of camber of any air foil is given here. It will give you results which are quite accurate. This is in the nature of a formula which appears as follows:

$$F_R = \frac{(3\,H_u + H_B)}{4\,C}$$

In the formula F_R represents the camber factor: H_u the maximum height of the upper surface above the cord line: H_B is the maximum height of the lower surface measured from the cord line. If the lower surface lies below the cord line as in the case of some air foils, the distance from the cord line to the under surface will be represented by $(-H_B)$. C in the formula represents the length of the cord of the air foil from the leading to the trailing edge.

You will notice that in the formula the digit 3 is placed in front of H_u. This quantity takes this form in the formula because the upper surface generates 3 times the amount of lift as the under surface. The K in the formula represents a constant. Usually it represents merely a numerical value which will balance both sides of the equation so that the answer will be given in the desired units, such as inches, feet, etc. By means of this formula, the camber factor of any air foil may be determined. Thus, it is a measure of the lift of the airfoil. If the camber factors of several airfoils are known, one may see at a glance the relative amounts of lift that they will produce. Thus, you may choose a high lift or a low lift air foil as you may desire. As an example of this, a table is given at the end of this article which lists various air foils and their camber factors. Later when we learn a few more points concerning characteristics of wings, a complete set of diagrams of these air foils will be given.

The Angle of Attack

As the wing of an airplane passes through the air when in flight the angle at which the air strikes the wing varies from time to time. This angle between the direction of air flow and the cord of the wing is called the Angle of Attack. The Angle of Attack is shown graphically in Figure No. 8. As you might imagine, the amount of lift and drag developed by the wing changes with this angle. The lift drag, or efficiency ratio, also varies with any change in it.

Figure No. 9 shows a graph that indicates the value of the lift, the drag, and the L/D of an average single surface air foil. The value of the Angle of Attack is given at the bottom of the graph. The value of the lift and drag is given at the left hand edge. The L/D values are given in the extreme left column.

By means of this graph the value of the lift or drag at any angle may be found. From the drag curve, you will see that the drag is lowest at about + 1° for high speed airplanes. The wing should fly at this angle when in level flight. The maximum lift as shown by the lift curve occurs at an angle of about 15° on normal airplanes. This is the landing angle. An airplane should have the greatest amount of lift when it is landing. Then it will be able to fly at the slowest possible speed. This condition applies to large ships but not to models. For models usually land tail high as there is no pilot in the plane to have it assume the correct landing angle through the operation of controls. The important point on the lift curve in the case of models is from + 1° to + 5°. The lift on this part of the curve is that which will be generated by a model during normal conditions of flight unless it is climbing steeply. Therefore, when choosing a wing section do not consider the maximum lift generated by the air foil but determine the amount of lift as indicated by the curve at the angle of incidence of your wing. Usually this is from 2-1/2° to 3°. When we speak of high lift sections in these articles, we refer to the amount of lift generated at these normal flying angles, not the maximum amount of lift that may be generated at 15° or 16°.

You will notice that the highest point of the L/D curve occurs between 3° and 4°. On some air foil sections, this maximum point occurs at from 5° to 6°. Your model should be designed so that when it is climbing the wing will assume an angle of attack at which occurs the greatest L/D value. Usually when a model climbs, the angle of attack increases from 2° to 3° from the angle of normal flight. Thus, if the wing is set at 2° angle of incidence, this will be the angle of attack in level flight, then when the plane is in climbing attitude the angle of attack will be approximately 4°. Under these conditions, the wings will be generating the greatest efficiency while the airplane is climbing.

(Continued on page 34)

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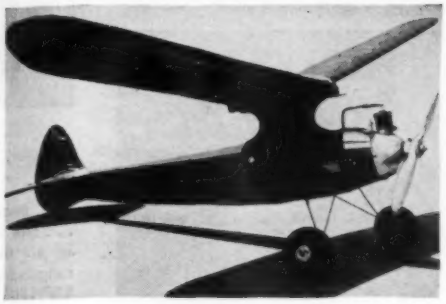
IT'S AS IMPORTANT TO HAVE *GOOD APPEARANCE* AS WELL AS *GOOD PERFORMANCE* TO GET THE MAXIMUM SATISFACTION OUT OF FLYING!
MODELCRAFT KITS GIVE YOU BOTH. Barney



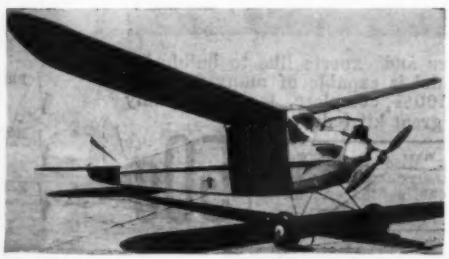
INTERCEPTOR

BUILT TO GET UP THERE AND IN A HURRY

SPECIFICATIONS

Wing Span 46", chord 7", flying weight 23 ozs. *Kit contains:* formed landing gear, beveled trailing edge, spun aluminum cowl, printed balsa parts, extra select gas model balsa, full size detailed plans showing both radial and beam type mounts, plenty of bamboo paper, cement, dope, complete test flight instructions and *gas model air wheels.* Kit **$2.95** POST PAID

PLANS ONLY..... 25c



SKY BABY

15¼ minutes on a 12 second engine run. Performance like this speaks louder than words. 'Nuff said.

SPECIFICATIONS

FLYING WEIGHT WITH OHLSSON "23"—27 ozs. Wing span 54"—Wing area 360 sq. inches. KIT CONTAINS spun aluminum cowl, air wheels, cement, dope, formed landing gear, colored gas model paper, printed ribs, select balsa, enlarged full size plans..... **$3.85**

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We carry a complete stock of Brown Motors and Parts.

Model "D" $12.50 Post Paid
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Model "B" $21.50 Post Paid
Model "M" $16.50 Post Paid

OHLSSON

MODEL "23"

Choke-full of power, speed and stamina!

SPECIFICATIONS

Horsepower 1/7. Bore 5/8". Stroke 5/8". Bare weight 4½ ozs., Height 3 9/16"..... $16.50 Post Paid

TORPEDO

Displacement .30 cu. in. 1/5 H. P. 8,000 r.p.m. with 12 in. prop..... $16.50 Post Paid

Flight Timer

Adjustable from 1 second to 5 minutes. Weight 5/8 oz. The first dependable timer made just for models..... $1.25

MISS TINY WINS!

1st, 2nd, 3rd at Pomona, California. (First 20 second engine run contest)
1st at Honolulu, T. H.—1st at Sunnyvale, California—1st at Finley, Ohio—2nd at *Detroit, 1939 Nationals*

SPECIFICATIONS

A pocket edition of the Pacific Ace 46" constant cord wing. For Ohlsson 23, Phantom and other 5/8" engines. Wing span, 46". *De Luxe Kit* contains spun cowl, silk, 2½" Voit Air Wheels, cement, dope, die-cut ribs, plenty of good balsa, and full size plans. Price..... **$3.95**

STANDARD KIT same, but with bamboo paper covering..... **2.95**

DRY KIT complete except for wheels, covering, cement and dope..... **1.95**

PLANS ONLY..... 25c

1939 PACIFIC ACE GAS MODEL

66 in. tapered wing. DE LUXE KIT contains tapered spars, beveled and tapered trailing edge, die-cut ribs, turned aluminum cowl, 1 qt. gas dope, 1 pt. cement, 3½ yds. super silk, formed landing gear, 4½ in. inflatable air wheels, dural wire, alum. tube, washers, bolts, haskalite, dural sheet, hook up wire, switch, selected hard balsa, full sized, black and white, plans with test flight instructions, complete.... **$8.50**

STANDARD KIT with bamboo paper, ½ pt. of dope, 1 pt. of cement and 3½ in. air wheels..... **6.25**

DRY KIT same as above without cement, dope, silk or wheels..... **4.75**

PLANS ONLY..... 50c

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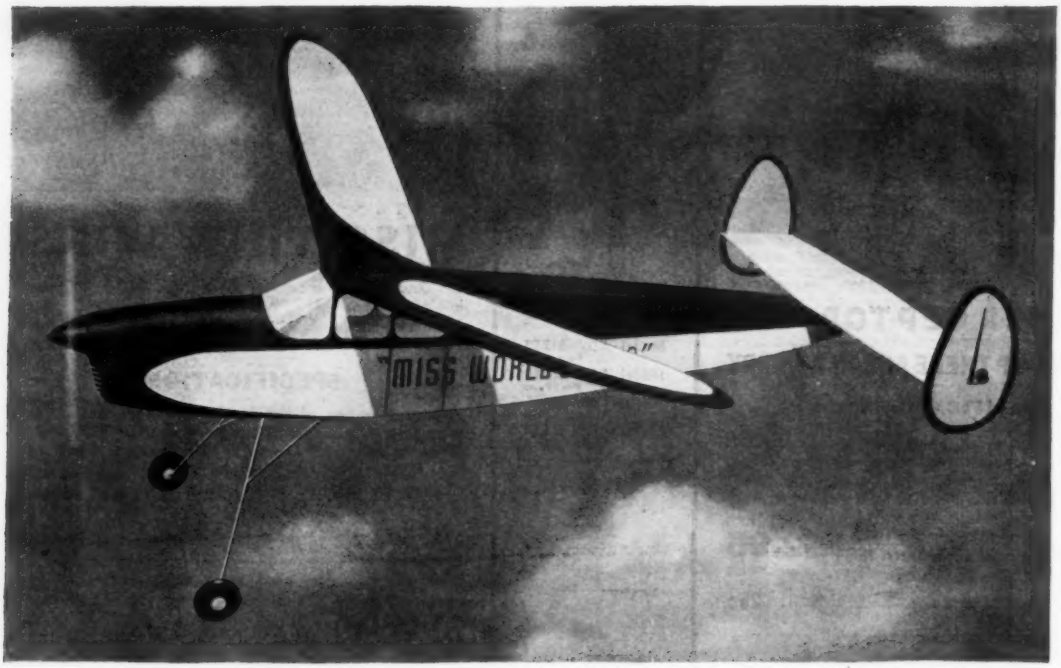
See the Prize-winning SCIENT

MISS WORLD'S FAIR

Just as the New York World's Fair is a monument to the progress of mankind SCIENTIFIC'S Miss World's Fair is a monument to the progress of model aviation. This new kit was made possible by the knowledge gained, over a score of years, through the experiences of thousands of model builders from all over the world. SCIENTIFIC takes pride in presenting this new low priced model of tomorrow to you model builders of today.



The Miss World's Fair is the type of all-around airplane that both beginners and experts like to build. Its simple framework is easily constructed and covered and the completed model is capable of many fine and consistent flights. Wingspan 30 inches—length 20 inches. The kit is 100% complete, including many finished parts and full-size plans, etc. Go to your dealer and look at this great kit today.

While you are at your local SCIENTIFIC AIRPORT, also ask to see the large "Miss World's Fair" which has a wingspan of 50" and 35½" in length. This giant of the air will amaze you with its completeness and you will be further astonished when you build it and find that it easily flies one mile. Price only $1.50 for 100% complete kit, including our full size, easy-to-understand plan.

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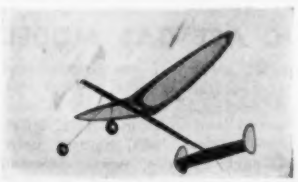

FLEETWING

30" wingspan . . . flies 5,000 feet.

This sensational SCIENTIFIC rubber powered distance chaser starts as if she is shot from a cannon . . . off she soars, climbing at the dizzy pace of 600 feet per minute . . . at a height of 250 feet the Fleetwing levels off and cruises for a distance of 5,000 feet. DON'T MISS THIS NUMBER AT YOUR DEALER

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SCIENTIFIC GLIDER

The popularity of gliders are fast ... into their own because they are so ... build. This SCIENTIFIC Glider ... a record flight of over 1 hour ... wingspan of 20⅝", Length 18" ... graceful wings, slim fuselage and many new features. Your dealer will gladly show you the SCIENTIFIC GLIDER.

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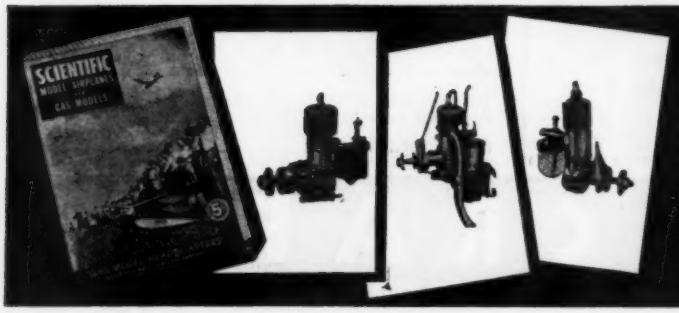

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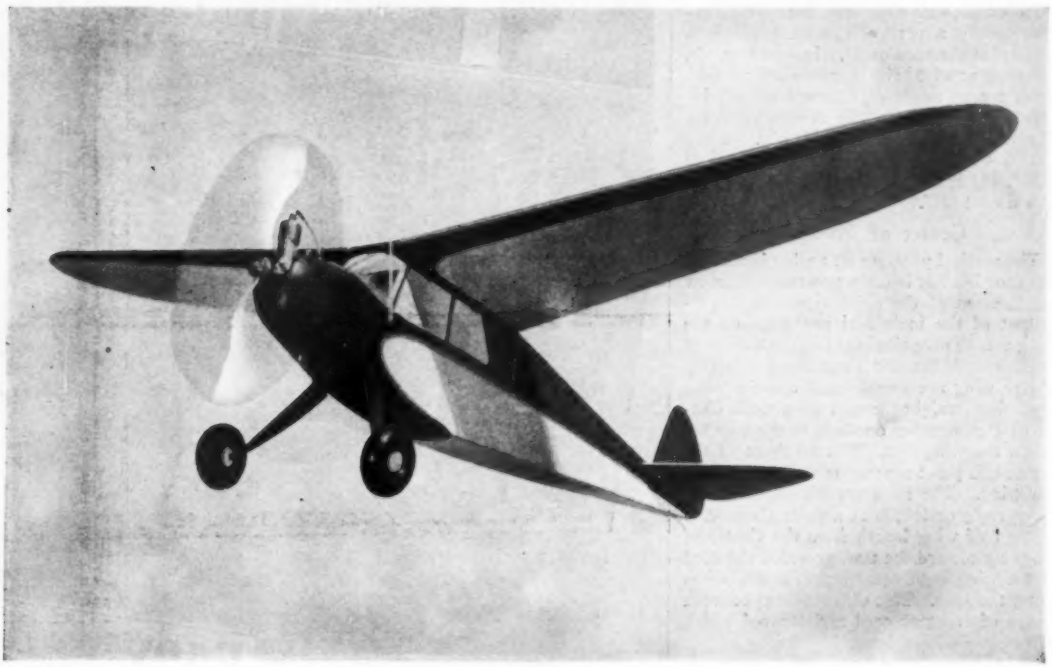
THE MERCURY

The new high climbing Scientific Mercury contest gas model not only flies like a real airplane but looks like one as well. The aerodynamic characteristics of the Mercury permit her to hang on her prop and climb straight up with no tendency to loop! A slow roll after the motor cuts brings her out on top as she starts a long, flat glide earthward. The rugged, easy to build structure of this model was stress analyzed for greater efficiency, thus insuring maximum strength for the least amount of weight.



Designed for any ½ or more H.P. engine, the Mercury, when being flown "just for fun," takes off on half-throttle after a surprisingly short run and climbs in slow, lazy, breath-taking circles.

A real scientific model from its staggered tail surfaces and tapered wing to its reinforced nose, whose careful planning prevents damage to the engine from a sudden nose-over in landing due to rough ground, the Mercury will give you more satisfaction for it out-performs and will out-last any ship in its class.

Wingspan 6 ft. Length over all 52 in. Total weight including motor and ignition units, 2¾ lbs.

The kit is complete with all necessary materials including a pair of 3½ inch streamline balsa wheels and a full-size plan with simplified directions. Honestly now, isn't this just the model you've been looking for? Go to your dealer today and see this bargain of all times.

$4.95 LESS MOTOR

DELUXE KIT . . . for a little more, SCIENTIFIC offers everything the same as above plus the addition of yellow, blue and gold SCIENTIFIC dope and a pair of 3½" pneumatic rubber wheels (in place of balsa wheels). A real big $10.00 value for only $6.95 (less motor).

FLYING YANKEE

20" Wingspan. She flies with the greatest of ease . . . just wind her up and she is ready to go . . . her tail lifts . . . she gathers speed . . . space does not permit an explanation of the Yankee's many features . . . but go to your dealer and look it over for yourself and be convinced that it is the greatest value of all times.

25c

THE ORIOLE

Scientific's old reliable. It has 50" wingspan, over all length 34". It conforms with the N.A.A. contest requirements and boasts of many cups won from Maine to California. Built for endurance and speed. Kit is 100% complete. The Oriole is so easy to build that even the beginner will turn out a masterful job, following the simplified plan. Of course your dealer has it.

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Fundamentals of Model Plane Design

(Continued from page 30)

It is very well to say, set the wing at an angle of 3°, however, there may be some mechanical difficulties in doing this. In such a case, the question is how much is the leading edge of the wing to be raised above a horizontal line through the trailing edge in order that the wing will be set at a 3° angle of incidence. The line through the trailing edge is drawn parallel to the line of thrust. This is considered to be horizontal. The cord line drawn through the leading and trailing edges of the wing should make an angle of 3° with this first line. 1° is approximately a vertical rise of 1/16″ in a horizontal distance of 4″. In other words, the tangent of 1° is approximately 1/64″. Thus for an angle of 3° the leading edge should be raised 3/16″ for every 4″ of cord. Figure No. 10 shows this clearly. If the cord is 4″ the leading edge should be raised 3/16″. If it is 6″ the leading edge should be raised 9/32″.

Center of Pressure

The vertical pressure on a wing is another term for lift. It is often necessary to know the location of the point at which the resultant of the individual pressures on the wing act. This point is called the Center of Pressure. When the right and left halves of any wing are symmetrical and the wing is passing straight through the air, the Center of Pressure lies one-half of the way between the wing tips. The resultant of the lift at this point represents the total lift on the wing. The resultant lift on each half wing, right or left, is at a point about 40% of the half wing length from the Center of the wing toward the tips, provided the cord of the wing is of equal length at all points along the span. This differentiates between wings of constant cord and tapered which will be considered later.

This condition indicates that the outer part of the wing does not lift as much as that part which is located near the center. It is due to the fact that a considerable part of the air flow which passes under and over the wing spills out of the end, thus reducing the lift near the wing tips.

One might suppose that the Center of Pressure on a wing would be located half way between the leading and trailing edges. Unfortunately, this is not the case. The position of the Center of Pressure not only varies with different air foil sections but with various angles of attack. This variation in the position of the Center of Pressure causes a change in balance of the airplane. In the case of a flat plate such a shown in Figure No. 11, the Center of Pressure moves in such a way as to create a stabilizing action. For instance, at small angles of attack shown at A the Center of Pressure is near the leading edge. If the angle of attack is increased as shown in the dotted portion of the surface, the Center of Pressure moves to the rear as shown at B. In other words, if a plane using a flat wing moves upward, the Center of Pressure will move backward and have a tendency to lift the rear part and bring the plane back again to normal flight, we may say that this is a stable action.

However, no planes use flat wings. Curved surfaces are necessary in order to

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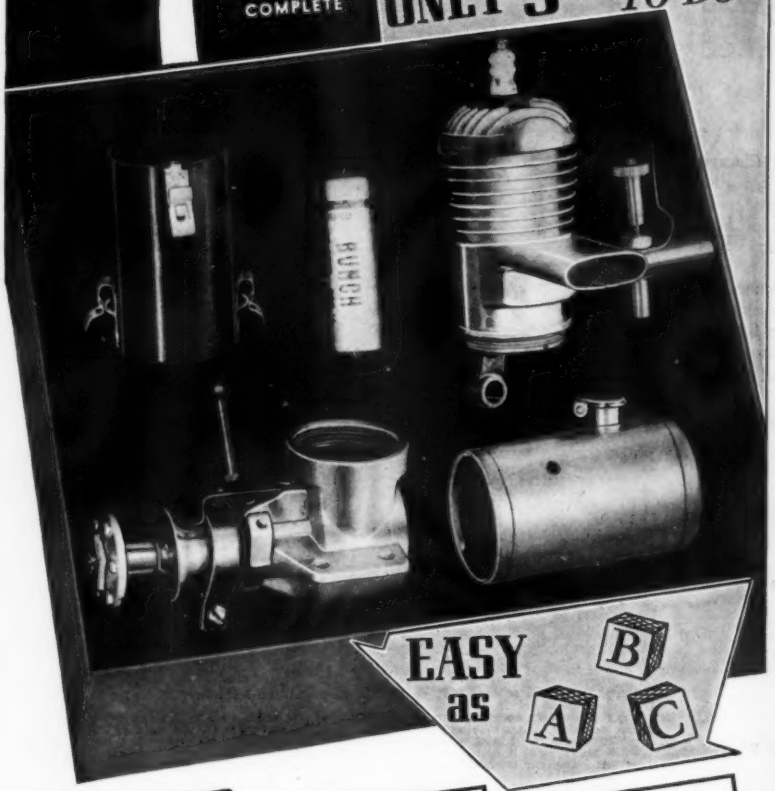

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Speedway Auto Engine Kit.....$11.85 ☐

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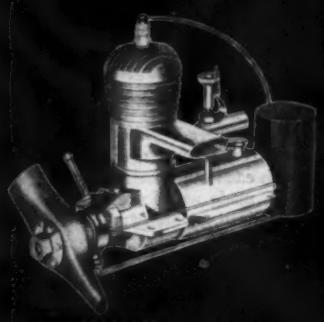
(Signed) "Beta" Model Aero Supplies.

Modern Bunch Motors



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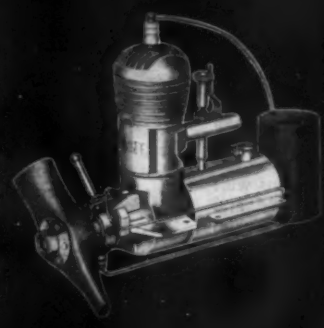

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Assembled block-tested and fully adjusted this engine at your dealer or from the factory. Price:

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3. The supreme achievement in the model engine field. This record breaking automobile engine has now reached official peak speeds above 18,000 R. P. M. Developed by Bunch engineers first successful with gas powered race cars. This ¼ H. P. Speedway has no equal. The only engine to completely stand up under strenuous racing competition.

Furnished with special automotive flywheel and rotates clockwise.

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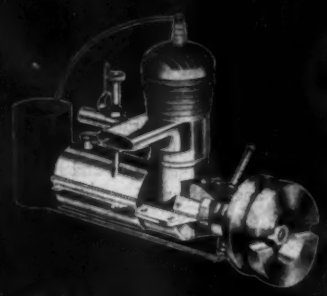

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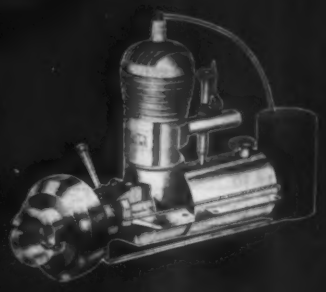
4. The original, best and only thoroughly engineered engine developed for breath taking speedboat racing. Block tested at 10,000 R. P. M. with 8 oz. balanced, electroplated flywheel slotted to drive a speedboat driveshaft. This motor has hung up amazing records for speed and endurance and added extra zip to speedboats from coast to coast. Start out right, power your speedboat with the Mighty Marine.

Price with flywheel $12.50



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The Car That's Fun to Run!

Specifications: Displacement 1/5 H. P. at 5000 R. P. M.; ¼ H. P. at 8500 R. P. M. Bore ⅞", Stroke ¼", Bare engine weight 6½ oz. Overall height including plug only 4¼".

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generate lift in sufficient quantity to have the plane fly properly. In the case of curved wings, the movement of the Center of Pressure is directly opposite to that existing on flat wings. At low angles of attack the Center of Pressure will act at a point indicated in Figure No. 12 by A. If the angle of attack of the curved wing is increased so that it assumes the dotted position, the Center of Pressure will move forward to a position B. Thus, if an airplane equipped with a curved wing increases its angle of attack, the Center of Pressure on the wing will move forward. This movement will tend to increase the angle of attack and nose up the plane still further. In other words, it creates an unstable condition.

This is one of the greatest problems with which airplane designers must contend, and is responsible to the greatest measure for the existence of horizontal tail surfaces.

Next month we will tell you something about the effect of speed on a plane and how the lift varies with any changes in velocity.

Table of Camber Factors for Various Wing Sections

Wing Section	*Factor*
Grant M-7	0.1140
" M-8	0.1048
" M-9	0.0932
" M-10	0.0838
" G-7	0.1135
" G-8	0.0994
" G-9	0.0883
" G-10	0.0795
Eiffel 400	0.0762
N.A.C.A. M-12	0.0538
Grant X	0.0885
" X-8	0.0777
" X-9	0.0692
" X-10	0.0623
" X-12	0.0533
" X-14	0.0457
" X-16	0.0393
Clark Y	0.0630
Clark Y Upper / R.A.F.-32 Lower	0.0740

The Baby Duration Trainer

(Continued from page 17)

150 square inches, use stock of the size specified on the drawing. If it is 170 square inches, use 1/8" square for the body and correspondingly larger sizes for the other wood.

Wing

A full size drawing of the wing should be made by following the dimensions on plate 2. Notice that the trailing edge is straight Use this as a reference line in the layout. The ribs must now be plotted carefully. A table of ordinate values will be found in the September 1938 issue of MODEL AIRPLANE NEWS on page 36. The same article also gives explicit instructions for plotting the ribs. Ordinates for the Clark Y tail sections will be found on page 35 of the October 1938 issue of MODEL AIRPLANE NEWS. When the ribs are plotted and cut out (they are plotted on paper and transferred to balsa wood afterwards), assemble the two wing halves. Cut the leading and trailing edges to shape, pin them on the full sized layout, glue the tips in place and hold with pins. Then the ribs may be cemented in their respective positions. When the halves are dry they are lifted from the board. (Put waxpaper over drawing to prevent frame from sticking.) The tips must be cut off and reglued with the proper amount of dihedral shown. Use pins to hold in place. Then the main dihedral is formed. Check all the settings for accuracy. When all the dihedral is in place and dry, the spars of hard balsa are glued into the notches in the ribs. The wing structure is now complete. Reinforce all the spar joints with cement. Note also that all the dimensions and wood sizes are on the drawing, so they are not repeated here.

Tail

The elevator is built just like the wing except that there is no dihedral at the center, so the spar and trailing edge are in one piece. It is assumed that the tail ribs and wing ribs were plotted and cut out in one operation. Such a method would save time. Also since the surfaces are small, it might be a suggestion to build the tail and wing simultaneously. To make the tail tips, make a full size pattern by scaling up the right tip on plate 2 which is graphed.. Draw 1/2" squares on some thin cardboard and then draw a dot on each side of each corresponding square where a line of the tip passes through the one on the drawing. Connecting the dots will give the outline. This is transferred to a piece of 1/8" x 3" balsa and cut out. Note that two are required. The tips are then streamlined, sanded and glued in place, checking the angle they make with the board with a 45 degree triangle.

Fuselage

The diamond type body is a streamlined version of the old box-type and has proven its worth. It is not very hard to build, but it has its own peculiar method of construction. To begin with, a *top* view of the fuselage should be drawn up using the dimensions given on that view on plate 2. Draw in all the cross-brace and jig positions. Before the body can be built up the jigs must be cut out; all the dimensions and instructions for this process being clearly shown on the main plate. Note that the tail hook bulkhead is the only permanent jig. The tail hook is bent and inserted into the bulkhead before the latter is glued in its place along the body. Make the hook of .034 music wire. Make it the locking type hook and before it is fastened to the bulkhead run some protective rubber tubing around it.

To start construction of the body, pin the two side longerons of 3/32" square on the outline. Glue the *bottom* halves of the jigs in their respective positions. *Don't* glue in the tail hook bulkhead now. Taking a third strip of 3/32" square, fit it in the notches in the jigs, running the full length of the body. Taper it where it meets the tail end and make a permanent joint here. Put a small drop of cement in each notch of each jig to hold it temporarily in place. Now fill in all the cross-braces and allow to dry. The perspective view of the lower right-hand corner of plate shows this preliminary process clearly. When all the joints are firm take out all the pins and lift this bottom half of the body off the board.

Now glue on the *tops* of the jigs, this time putting the tail bulkhead in place. The same operation as explained before is repeated here, and this will result in a complete, accurately made fuselage. When this is dry all the jigs except the very last have to be cut out of their positions with a razor and slipped out of the openings in the frame. All joints on a structure of this type must be especially strong. The .034 wire landing gear is now bent. Looking at it from the front it consists of two "M" shaped pieces; the rear having shorter legs than the front, with the axles bent into the front piece.

Observe that the landing gear is bent forward looking at the side. In the braces where the landing gear struts attach cut shallow "V" grooves to accommodate the wire. Cement the pieces into the grooves and bind with thread. Now recement. The front and rear struts are similarly connected with each other half-way down. The wheels are made as according to plate 2; well streamlined, painted and attached. The wire wing mount is shown in complete detail on the drawing and special perspective and is attached to the body frame just like the landing gear.

The tail block and sub-rudder are both made of 1/4" plywood made by laminating two sheets of 1/8" balsa. They should both be glued in place before being given the proper section and the fuselage should be covered before they are given the final sanding. A "V" cut is made in the sub-rudder. The bamboo outline is glued into this and held down with pins till dry. Then the pins are removed and the balsa around it is sanded so that the bamboo will look integral with the rudder.

Propeller

The prop dimensions are shown on the drawing and should be laid out on the balsa accordingly. It might be a good idea to make three propellers; a 10", a 11", and the 12" shown. If the first breaks replace it with one of another size; noting any difference in performance and speed. The propeller of course is of the standard right-hand type. All the different sizes would be carved from 1" x 1 1/2" blocks. The prop is finished down with three to five coats of dope or banana oil and should then be painted silver. Make it strong at the hub.

Covering

Now that the whole framework is done, covering is the next logical step. Cover the wing and tail with a bright tissue. Red or orange are recommended for visibility, though any color may be used. Apply tissue to frame with banana oil. Spray with water to tighten. When no moisture is left on the covering, apply three coats of banana oil or dope.

To cover the body, obtain some 1/32" medium soft sheet balsa. Cut to approximate shape and cover one side at a time. Apply cement quickly over the particular side to be covered, place the balsa on top and hold in place with an abundance of pins. The diagonally opposite side may be covered next. When these two are dry the pins are removed, and they are roughly trimmed down so as not to interfere with the covering of the remaining two sides. When all the body is covered, carve a nose block to shape and drill a hole in it to accommodate the prop shaft. The nose block is slipped in place and the whole body is sanded down smoothly. When finished sanding it should look as if the nose block is part of the body, and the tail block and

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NOTE: *C-D's Dry kits GP-66 and 69 contain full size drawing, covering tissue, printed wood, strip wood, music wire, celluloid, nose blocks, screws, etc. Wet kits have all cements, colored dopes and pneumatic wheels added. Complete kits except Cloudster (as described) have everything the "Wet" and "Dry" kits have plus a timer, battery holder, booster plugs, jacks, hook up wire and a propeller to fit your motor. Select the motor you desire and add to the complete kit price and you will have everything you need for your gas model.*

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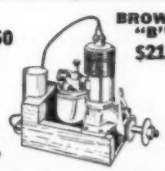

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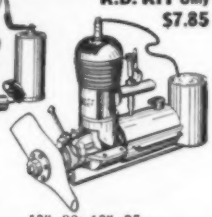

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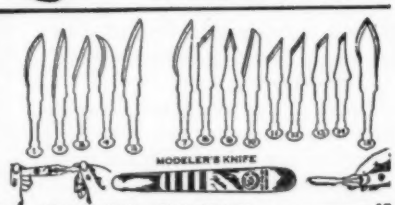

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RC-1 PRR type N-5..... .10

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RF-1 C&NW 46' 50 ton .10
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RF-3 B&M 46' 55 ton.. .10
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RG-1 L&N 41' 50 ton.. .10
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COMPLETE GAS MODEL KITS INCLUDING LIQUIDS (Except Power Unit)

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Contains More Items Than a Dozen Average Model Making Catalogs Combined

Cleveland's super catalog contains among many other things the following: Wide variety of gas models. Largest assortment of fine rubber-driven model airplanes the world has ever seen in three different sizes to fit all purses. Miniature racing cars in an assortment from 10c authentic Indianapolis winners to models actually driven by gasoline engines. Supplies—all sizes of strip and sheet pine and balsa wood, wheels, cements, colors, special wood parts, metal parts, propellers; and for gas models a wide variety of gas engines, timers, battery holders, starters, spark plugs, coils, switches, Gasoline driven speed boats. Model yachts. Old time sailing ships. Modern war ships. Merchant vessels. Fittings of every imaginable type and size at all prices. Miniature trains of all sizes—and since we are specializing in C-D and HO we have a tremendous variety of kits and parts for these most popular gages. Tremendous assortment of fine rotary cutting tools and grinders, knives, fine drills and taps. All the hard-to-get sizes of wires, tubing, sheet angle and rod materials in various metals, small screws, nuts, bolts and special fittings. Wide assortment of books and drawings. Truly this catalog for all modelbuilders containing many thousands of items will be a revelation to modelbuilders who have never seen it before, for it is larger in number of articles than any dozen other American modelmaking catalogs put together. You simply can't do without it. Other in demand items we list are: candid and folding cameras and all necessary sundries, supplies, etc., finished archery equipment, sets, and supplies for the beginner; also handbooks, microscopes, telescopes, field glasses (for chasing models), etc., etc. No modelbuilder can afford being without this "catalog of catalogs"—don't delay having it—get it right now. If accompanied by order for $1.50 or more, we'll send it free when requested. Otherwise send 10c, which is refundable on your first order for $1.50 or more (if received within 30 days).

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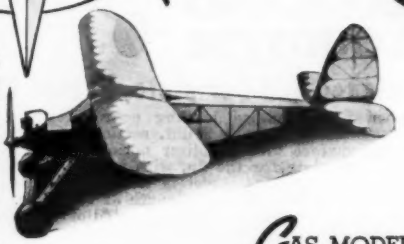
Megow's the NATION'S

COMMANDER

Wingspan, 6 feet. Stabilizer span, 29¼". Wing area, 570 square inches. Uses any ⅜" motor. 3½" streamlined rubber wheels.

$4.95
Plus 20c post.



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America's best-known gas model! A consistent winner embodying many desirable features. Fail-proof landing gear that absorbs hardest shocks. Fully adjustable rudder. Span 7 ft. Wt. with motor, 5 lbs. Kit includes 3 full-size plans, cut-out prop. blank and all necessary materials. Less motor

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PIPER CUB $3.95

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Wingspan, 51½". Stabilizer span, 18⅞". Wing area, 278 square inches. Uses any ⅜" motor. 2½" streamlined rubber wheels.

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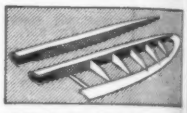
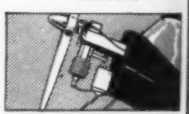
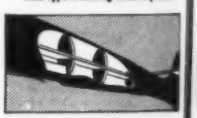


Hollow-Carved and Finished Leading Edge

Realistic Cabin



Skid-Type Mounting Takes Any Motor



Easy-to-Build, Accessible Fuselage Construction

New construction ideas, most practical size. Megow's hollow-carved Leading Edge. Scale spacing of struts and ribs in wings and fuselage. Span 52¾". Overall length, 33½". Suitable for use with any ⅜" motor.

Bassett's CARDINAL $3.95

Plus 20c post.

Designed by Maxwell Bassett especially for Megow's. Ready-to-use propeller. All metal parts die-cut. Special rubber wheels. Uses any ⅜" motor. Span 48". Length 29½".

World Champion $4.95 QUAKER FLASH

Plus 20c post.

Cut-out propeller. Extra hard balsa wood, sheet aluminum for cowl and all necessary parts and supplies. Wings removable and gear folds back for carrying. 3½" puncture-proof wheels. Span 67". Length 47".

GAS MODELS that really *look like* actual passenger-carrying airplanes . . . that perform in contest-winning style by following the principles of design used in the world's most famous airplanes! Gas models, the building and flying of which lead directly into the field of aviation!

Megow models have realistic cabins, and sacrifice nothing in true design to make them fly. Megow gas-powered models are replete with exclusive features hard for the successful builder to do without.

For instance, note these features of Megow's new COMMANDER and CADET models. Leading Edges hollow-carved, ready to use in the strongest wing construction ever known. Easy, quickly built monocoque fuselages . . . strong, slender, streamlined. Skin construction fuselage permits easy installation of parts and a skid mounting that takes any motor. With their high Aspect Ratio, steep climbing ability, long, flat glides that take *full wingspread advantage* of every thermal, these new models are masterpieces of beauty and performance.

The COMMANDER . . . of which the CADET is a smaller, lighter replica for use with ⅝" motors . . . is the crowning achievement of over a year's work in research department and on the flying field. Already widely imitated, it pioneers into a new world of gas model flying.

The WORLD'S RECORD HOLDER

A QUAKER FLASH, built and flown by Roland Fischer of Denver, Colorado, today holds the world's record of 26 minutes, 25 1/5 seconds, using a fuel allowance of 3/16 ounces.

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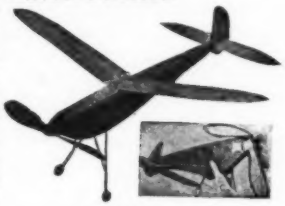
Aerodynamically perfect, yet easy for the average builder. Everything designed to increase glide . . . a brand-new type of folding propeller avoids wind resistance when power stops, wing streamlined into fuselage, thin wheels, all-wire landing gear (folds back to pack in box), streamlined tail section. Rubber tensioner prevents shifting weight of unwinding rubber. Meets all A.M.A. specifications. Kit complete with rubber, plans and all supplies.



$1.50 Plus 20c post

Span 41". Wing area 147 sq. in. Wing Chord 3⅞". Aspect Ratio, 12. Weight 4.23 oz.

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Rubber Powered

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50c Plus 10c post.

Models of famous planes, interesting in detail and design . . . plus the ability to compete successfully in endurance flights. Turned nose cowlings on all flying models. STINSON RELIANT, RYAN SC, ARROW SPORT, AERONCA K, HOWARD DGA8, REARWIN SPEEDSTER, CESSNA C-34 and others.

50" FLYING MODELS

When you want something really spectacular, build one of these giants. You will amaze your friends with its long flights and flat glides to a perfect landing. Its MOTOR HUM adds realism. These big outline scale models are light-weight, strong in construction, expertly engineered, and the plans and photos are so clear that building is very easy. In addition to the TAYLOR CUB shown here, there's the WACO at $2.00; the 50" STINSON RELIANT at $1.50; the MONOCOUPE or HOWARD DGA8, $1.25; FAIRCHILD RANGER, REARWIN SPEEDSTER or AERONCA K, $1.00. By mail, 15c postage additional.

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Developed specifically for gas model use, these wheels have important advantages notfound in pneumatic air wheels. Made of special sponge rubber, bothersome punctures and deflation troubles are avoided and great resiliency secured. Lightest weight wheels obtainable.

2½" . . . . per pair, 60c (½ oz. each)

3½" . . . . per pair, 75c (1¾ oz. each)

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CADET | QUAKER FLASH | GAS MODEL WHEELS
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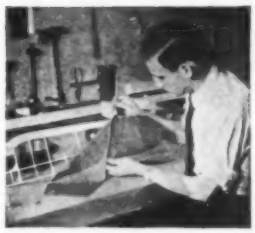

A light, tough, non-porous smooth covering for model airplanes, etc. Easy and quick to apply. Elastic, PLANEFILM stretches into a drum-like almost indestructible colorful covering. It is self-colored and requires no glue or dope.

COLORS: Red, Blue, Yellow, Silver, White, Black.

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		Solvent and Postage
Sq. Yd.	$1.50	Plus 30c
36" x 18"	.80	Plus 25c
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SOLVENT: ½ oz. 5c; 1 oz. 10c

MEGOW'S AIRCRAFT DOPE

Same as used on regular airplanes. Fine quality, brilliant, smooth-flowing, quick-drying. Dense, rich colors can be thinned to 50% and still have great covering capacity. Fine for spraying. Sizes from 5c up. At your dealer's or send for color card.

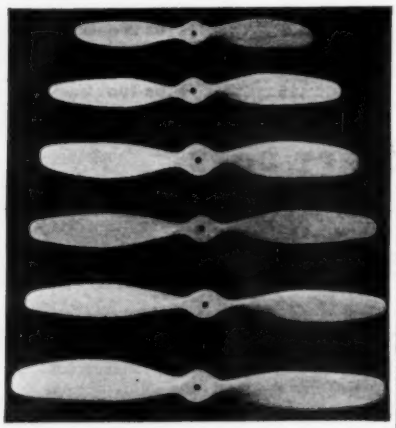
MEGOW'S KWIK-DRY CEMENT

Quick, firm-gripping, transparent, waterproof. Easy to use. Not only the most satisfactory cement obtainable for model building, it answers a multitude of household uses. In tubes—no waste, no mess, no bother. 5c and 10c. Larger sizes in bottles and cans. Ask for it at your dealer's, or order direct from our catalog, if he cannot supply you.

SEND 5¢ POSTAGE FOR THIS BIG PROFUSELY ILLUSTRATED CATALOG

100 pages, showing scores of gas and rubber-powered model airplanes, model ships and motor boats, HO-gauge railroad equipment, ready-made parts, tools and supplies used by hobbycrafters.

LOOK!
GAS MODEL PROPS
25c
ANY SIZE



John Findra, Jr., of New Brunswick, N. J., wins class "A" at the 1939 Nationals using a MODELCRAFT 9" prop on his Bantam engine.

Your ship is no better than its engine and the engine is no better than its propeller—when the best only costs a quarter (25c). Why pay more?

Your 25c Modelcraft prop has behind it the same hours of tests, exhaustive research and mechanical engineering that goes into propellers for the latest military and commercial planes.

STOCK UP NOW—carry plenty of extras in your tool box. Complete range of sizes 9", 10", 11", 12", 13", 13½", 14". Due to the enormous demand, Modelcraft has doubled their original equipment and now operate 2 machines for building the finest, most efficient props in the country.

Buy from your dealer or Modelcraft

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sub-rudder are molten into the contour. Use ten-nought sandpaper for a final finish and then apply three to five coats of banana oil with intermediate sandings.

Assembly

Before the tail is glued to the top of the tail block, cut away part of the tissue on the bottom at the center so that the wood of the tail will make a direct contact with the wood of the block. It may now be cemented in place and should be lined up accurately and carefully. The wing is held in place with a rubber band of 1/8" flat rubber. The propeller should use a good free-wheeling device and possibly a ball-bearing washer. Otherwise use about six bronze washers. Put a long bushing in the nose block and smaller ones into the front and back of the propeller. See that all bearing friction is minimized. The propellerd shaft should end in a locking hook so that extreme rubber tension will not straighten it out. Use 12 to 14 strands of 1/8" flat brown rubber that may be lubricated with castor oil, glycerine, green soap or any other popular "lube."

Flying

If the model has been well built is should fly "off the workshop table." Test by adjusting for a good glide first. See that the prop has the down and right thurst specified on the assembly plate. Wind up a few turns by hand, launch the ship and note the reaction. If satisfactory, increase the turns gradually; 800 is about the limit on 14 strands but this is enough to get the model out-of-sight on a favorable day. If the test flight is not perfect work on the wing and prop adjustments till everything is O.K. Your efforts should be recompensed by a compact and beautiful little soaring job.

They Gave the World Wings

(Continued from page 7)

A life-saving station was situated at Kill Devil Hill nearby and that was all that marked the location. Sand dunes stretched for miles along the coastline. It was a wind location not far from the Cape, but it was admirably suited to the needs of Wilbur and Orville Wright, who, possessed with an idea, set out to demonstrate the value of the machine they had made.

Trouble started early for the Wrights at Kill Devil Hill. Only a few days after their arrival motor trouble developed and it was necessary for one of them to return to Dayton for the repair parts. Orville Wright set out immediately for his home town to get the necessary motor shaft. It was the 11th of December before he returned with the new material.

For the next few days both brothers were busy trying out the new equipment and getting the plane in readiness.

On the night of December 16, 1903, a cold wind came from the north and by the next morning ice had formed on small puddles of water about the ground. Hoping the wind would die down sufficiently to enable a test flight, the two men waited impatiently for a turn for the better.

By ten in the morning, conditions had not changed and the signal was given to the life-saving crew stationed in the Light House to come over and help.

There was unquestioned danger in an attempted flight into the high wind. Both, however, were anxious to try their machine. A flip of a coin decided who was to be at the controls and Orville won.

He lay down on the fuselage rail of the plane and took the controls. The wire on the ground track was released and the machine started into the face of the twenty-seven mile wind and was held almost motionless. Wilbur ran alongside to hold the wing and balance the craft on the runway.

For forty feet the machine ran along and by the time it had reached the end of the tract it had risen to a height of ten feet. This was a rather erratic air trip, up and down, due to the inexperience of the pilot, but it must be remembered that this was the first flight ever made by man. Much schooling is needed on the subject.

At times the machine was ten feet in the air. Then, it swerved into the ground with undulating motions. One hundred and twenty feet from the starting place the plane struck the earth. The initial flight had lasted twelve seconds, but it was the first made in history, in which a machine carrying a man had raised itself, by its own power, into the air in full flight, had sailed upward without reduction of speed and finally had landed at a point as high as that from which it had started.

"Our laboratory experiments made that first flight possible," emphasizes Orville Wright today, "the same is true now, the most important advances in the airplane itself again are coming from the study of aerodynamics."

Early Experiments

The thought of soaring through the air like the birds appealed to the Wright Brothers at first more than the thought of a power-driven machine. Consequently they devoted most of their early attempts to gliding. Besides they had seen from the experiments of others the wasteful extravagance of mounting delicate machinery on wings and they knew not enough yet to accomplish this, nor had enough money to finance such costly experimentation. For this reason the Wrights in early periods of their experimentation belonged to the gliding school of thought concerning flying.

It was no easy matter to glide through the air, which they soon found out when they graduated from the kite flying stage into the actual gliding experiments.

There were many methods of gliding: Some placed the center of gravity far below the wings in the belief that the weight would naturally seek to remain at the lowest point. This was good reasoning, the Wrights thought, since it was true that the pendulum tended to seek the lowest point. But also like the pendulum it tended to oscillate in a manner destructive to all stability. Therefore, a more satisfactory system, especially designed for lateral balance, had to be found.

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REAL ENGINE VALUE—$5

Here is your opportunity to buy a kit of the famous G.H.Q. Gasoline Motor. ABSOLUTELY COMPLETE—ALL MACHINING DONE—READY TO ASSEMBLE. All you need is a screwdriver. BUILD YOUR OWN ENGINE AND SAVE!!

AN ENGINEERING TRIUMPH . . .

Never Before at So Low a Price!!

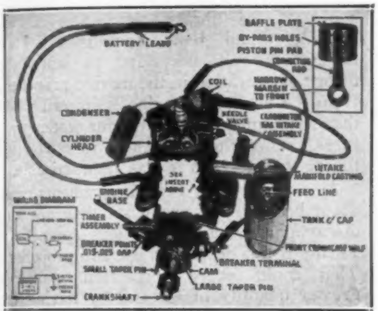
Indeed an engineering triumph—accomplished by outstanding G.H.Q. designers and engineers, who have constructed into the G.H.Q. motor everything that years of exhaustive scientific aerodynamic research could produce—geared to the highest possible degree of perfection. But more than that, the acid test . . . an overwhelming response. Thousands of users in all parts of the country are praising, recommending, and endorsing this scientific achievement. It seems as if everyone in America wants one. The most hair-raising thrill you've ever experienced will be yours with the G.H.Q. motor—actually one of the most powerful motors ever constructed. Has broken records for amazing performance . . . and just imagine—flies model planes up to 10 foot wingspread. AND JUST AS EFFICIENT FOR BOATS, MIDGET CARS AND STATIONARY USE. Easy to start and simple as ABC to assemble.

Everything is in the kit including Champion spark plug, Winston coil, condenser, tank and cap, ignition wire, cylinder, piston, connecting rod, timer, crankshaft, all screws, nuts, bolts, complete instructions, etc. Every part is fully machined and finished. No oil, gas, batteries, or propeller included. A SCREWDRIVER IS THE ONLY TOOL YOU NEED.

EXACTLY THE SAME PARTS THAT GO INTO THE G.H.Q. ASSEMBLED ENGINE

ALL PARTS GUARANTEED

Average Assembly Time 30 Minutes



THE ONLY ENGINE WITH A WARRANTY—APPLIES TO BOTH ASSEMBLED ENGINES AND KITS

Over 7000 of these same famous G.H.Q. Gasoline Engines have been sold at $8.50. Mass production methods and enthusiastic reception have enabled us to reduce the price from $35 originally TO THE NEW LOW PRICE OF $5.00.

The new 1939 model now for sale includes the new unbreakable steel stamped piston giving high and perfect compression, drop forged one-piece crankshaft, self oiling "Ledaloyl" bronze bearing, etc.

SPECIFICATIONS

4 Port 2 Stroke Cycle. 3/4" Stroke. 15/16" Bore. 300-7,000 R.P.M. Turns 14" Prop. 8" Pitch. Bearing Surface, 1 1/4" Long. Crankshaft, 5/16" Diam. Weight, 10 oz. (Motor) Rotation, Either Direction. Height, 4 1/2"—Width, 2 1/2". H.P. Approx. 1/5th.

G. H. Q.'s FIFTH YEAR!

Thousands of Satisfied Users! Read some of these testimonials on file with us:

J. B., Providence, R.I.—"A few weeks ago I received the G.H.Q. motor kit and it is running perfectly. I hope to write you soon and tell you about some excellent flights."

R. H., Prairie du Chien, Wis.—"Your motors sure can take a lot of abuse and knocking around and yet perform perfectly. I have had two in a period of about two years and have seen higher priced motors give less service and performance."

W. W. M., Russellville, Ark.—"I received my G.H.Q. Motor Kit and am very well pleased. I had motor together in 1 hr. 40 min. I will place order next week for G.H.Q. Sportster Kit."

W. L., Claysburg, Penn.—"A wonderful motor that thrills any air-minded person. Strong and neat looking. As good as motors costing twice as much."

A. K., Hillside, N.J.—"I still can't understand how you can put such a dependable and rugged engine on the market at such a low price."

E. T., Sayville, N.Y.—"Received my G.H.Q. Kit okay and am more than delighted with same. You've got 'em all beat for price and performance."

R. P., Hamburg, N.Y.—"I want to extend my personal thanks to G.H.Q. for their prompt service. The motor I ordered was received within 24 hours. Such service cannot be surpassed. I also want to say that I have the motor running perfectly. I shall do all I can to help promote the success of G.H.Q."

H. H., Midlothian, Ill.—"Motor assembled correctly and performs perfectly. I am fully satisfied."

L. N., So. Euclid, Ohio—"Received my finished motor. I am very pleased with it and runs fine. I will be glad to encourage others to get G.H.Q. motors."

C. C., Chicago, Ill.—"I received my motor and I am quite satisfied and surprised at the precision parts for the money."

E. E. F., Mare Island Navy Yd., Calif.—"I saw your offer of a complete G.H.Q. Gas Engine Kit for only $5 in the August issue of Mechanix Illustrated. I have just cracked up the G.H.Q. that I bought this spring. It had over 50 hours on it, and I have had very little trouble with it, and made my own repairs whenever the engine needed them. As I was glancing thru the magazine, the ad struck my eye. At that price I will be able to pursue my favorite hobby again, gas power models."

THE G. H. Q. GAS ENGINE CAN BE USED IN BOATS MIDGET CARS & PLANES WITHOUT ANY CHANGES

The G.H.Q. Gas Engine sold four years ago for $35. Today, you can secure a vastly improved engine kit for only $5. How is this possible? Simply because we have invested thousands of dollars in tools, jigs, dies and equipment to produce the only mass-production motor in the market. All parts are uniformly perfect.

1939 SALES OF G. H. Q. ENGINES ARE AT THE RATE OF

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DEALERS!

The G.H.Q. MOTOR KIT and the new low-priced

ROBOTAIRE

are sweeping the country. Get your share of this business!!

Our new discount schedule gives larger dealer discounts than ever before!

Write in Today!

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1. Little investment needed.
2. Attractive discounts.
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.014 ..... 6 ft. 2c
.020 .028 6 ft. 3c
.034 .040 6 ft. 6c
.049 ..... 6 ft. 8c
1/16" ..... 3 ft. 5c
3/32" ..... 5 ft. 15c
1/8" ..... 5 ft. 25c

BROWN RUB.
1/16 sq. 15 ft. 5c
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1 1/2" 8c, 2" 12c
2 1/2" 14c, 3" 17c

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5x7-4c 14x17-15c

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CLEAR DOPE THINNER
1 oz. 5c. 1/2 pt. 30c
2 oz. 9c. pint 50c

Colored Dope
1 oz. 6c. 2 oz. 11c
1/2 pt. 35c, pt. 60c

PROPELLERS
Balsa Paulo Ritz Wins Gas
5- 4c- 7 Mod.
6- 5c- 9
7- 6c-12- 9-40c
8- 7c-15-10-40c
9- 8c-19-11-40c
10- 9c-23-12-50c
12-10c-28-13-50c
14-12c-X-14-50c
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SPRAY GUNS
Sm. 59c; Lge. 97c

Prop Shafts—doz.
Sm. 6c Lge. 10c

WHEELS per pr.
Brch Bisa A Celu L
1/2 .01 .03 U
3/4 .02 .04 .05 M.
1 .03 .05 .07 .06
1 1/2 .04 .07 .10 .09
1 3/4 .06 .10 .16 .12
2 1/2 .12
3 .15 .30

Traxler Wheels
1 1/4, 1 1/2—40c1 pr.
1 3/4, 2—50c 1 pr.
2 1/4, 2 3/4—60c 1pr.
Gas Mod. 2 3/4—$1
3-1.25—3 1/2-1.50
4 1/2-1.75 all p.p.

M&M WHEELS
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1 3/4, 2, 2 3/4–60c
Gas. Mod. 2 3/4–90c
2 1/4 1.50, 3 1/2 2.75
4 1/2 2.75—5" 4.00

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SKYWAY MODEL AIRCRAFT SUPPLY CO.
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They arranged the wings in the shape of a broad V to form a dihedral angle, with the center low and wing tips elevated. In theory this was an automatic system, but in practice it had two serious defects—it tended to keep the machine oscillating and its usefulness was restricted to calm air.

Because the Wrights centered their interest around this principle of balance and because they felt it wrong and developed a new system of their own, this may have had a great deal to do with their ultimate success.

Lilienthal and Chanute had guided and balanced their planes by moving the operator's body from place to place on the craft; thus the shifting of weight allowed control of the machine. The Wrights, however, thought this was not such a good plan because the weight to be moved and the distance it could be moved were limited. At the same time, this had nothing to do with increasing the density of the disturbing elements.

They sought to employ a system whereby the operator could vary, at will, the inclination of the different parts of the wing and thus obtain from the wind forces to restore the balance which the wind itself had disturbed. This was the first introduction of the aileron.

After many experiments with gliding the Wrights felt they could master the art of flying if they but had an engine light enough and powerful enough to lift the ship into the air and supply it with motive power. By this time work in their bicycle shop was of second importance to their airplane experiments, so they spent full time working on the craft that was to be the first successful airplane.

They wrote to a number of automobile and motor builders stating the purpose for which they desired a motor and asking if the companies could furnish one that would develop about "eight-brake horsepower with a weight complete not exceeding 200 pounds." Most of the answers they received were very discouraging.

Finally they decided to undertake the building of the motor themselves. They estimated that they could make one of the four cylinders with a 4-inch bore and 4-inch stroke weight not over 200 pounds, including all accessories. Their only experience in motor mechanics up to that time was the construction of a small engine which was used to run the machinery in the bicycle shop.

With the aid of Mr. S. E. Taylor, who also did much of their later experimental work, they soon had the motor completed and on the block, testing it.

One thing they overlooked, however, was designing a propeller which would have the proper thrust. They had studied very little on this principle and had to delve into the books at the library concerning marine propellers and their operations. They thought it only necessary to learn the theory of operation in the marine propellers from the books on marine engineering and then substitute air pressures for water pressures. When they attempted to apply this theory they learned it was impracticable.

As a result many heated arguments came about between the two when they got into discussion about the various propellers. Finally it was decided to use two propellers. They could secure a reaction against a greater quantity of air and by having the propellers turn in opposite directions the gyroscopic action of one would neutralize that of the other.

When this job was done and the problem of gearing up the props with chains was solved, the Wrights were ready to take their motor-driven machine to Kitty Hawk for its trial flight.

What happened there is now history.

The First Military Airplane

Although that first flight at Kitty Hawk marked the first time man had ever flown in a power-driven flying machine, it was a skeptical world that read the news dispatches telling of the Wright Brothers' success. And most skeptical of all was Uncle Sam for the officials in Washington remained very much "aloof" to the foolhardy idea that man could "fly like the birds."

Not until almost six years later on Aug. 2nd, 1909, did the government show real serious interest in the airplane. Then Brigadier General James Allen, Chief Officer of the Signal Corps, formally approved the recommendation of a board of officers appointed by the War Department that the army purchase an airplane built by Orville and Wilbur Wright at their Dayton, Ohio, shop.

The contract entered into with the Wright Brothers called for a heavier-than-air machine capable of carrying two persons with a combined weight of 350 pounds, sufficient fuel for a flight of 125 miles and able to remain continuously in the air for

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an hour with this load. Other characteristics specified were that the plane could be steered in all directions without difficulty and at all times under perfect control and equilibrium, and that after the flight the plane would be able to return to its starting point and land without damage that would impair its ability to immediately start another flight.

The plane was required to have a speed of 40 miles per hour in the air, and the contract provided a bonus to the manufacturer of 10% of its purchase price for every additional mile up to 44 miles per hour and a penalty from them of 10% of the purchase price for each mile below 40 m.p.h. The minimum speed acceptable was specified as 36 miles per hour.

In tests the plane flew 42 miles per hour and eventually attained a record speed of 47 miles per hour.

The plane itself had a wing spread of about 40 feet and a wing area of some 500 square feet, weighing approximately 800 pounds. The lateral control of the plane was effected by warping the wings. The double elevators and the rudder were supported in front of the wings by an outrigger arrangement. The landing gear consisted of two runners, or skids, and the plane was launched from a monorail.

The power plant of this first military plane was also designed by the Wrights. It was a 4-cylinder, water-cooled engine producing 25 horsepower at 1400 revolutions per minute and driving two 8 1/2 foot wooden propellers by means of gears and chains. The propeller speed was about 400 revolutions per minute.

By way of comparison its forty foot wing would look mighty small beneath the 150 foot span of the Boeing B-15, with its four nine-cylinder, 1500 horsepower Wasp engines, and their whirling three-bladed steel propellers capable of turning over 2500 r.p.m. and better.

With such a striking contrast it is little wonder that Lahn, Humphreys, Arnold and others of the first military aviators reminisced at this air corps "birthday party." Missing, however, from the ceremonies was Orville Wright himself, who probably could tell more than any of the others about the trials and hardships which led to the mighty winged giants of today.

The Army's First Birdmen

Aviation was first utilized by the army as early as the Civil War, for during this period observations for the army of the Potomac were made from balloons by civilian aeronauts. The army purchased a balloon from France in 1890 and this was used in Cuba during the Spanish American War, but not until 1909 did the War Department start to make use of the heavier-than-air flying machines.

However, it was one year earlier, on August 2nd, 1908, at Fort Meyer, that Lieut. Thomas E. Selfridge made his first solo flight to become the first army officer to fly alone in an airplane. On the same day he crashed with Orville Wright never to regain consciousness to the day of his death on Sept. 17th of the same year. Selfridge was the first airplane casualty. In the same crash Orville Wright was seriously injured and because of these injuries has done little flying since.

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CLIMB is important in every contest model but, watch the glide. It really counts most. You have nothing to worry about when your ship glides into a "riser" . . . she is sure to stay up for plenty of time.

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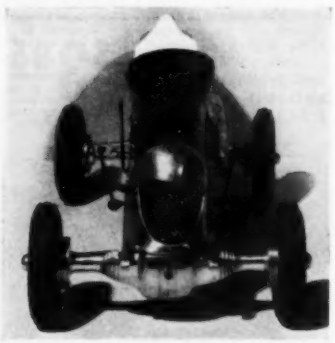

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H & F MODEL AIRPLANE CO.
459 BRISTOL ST. BROOKLYN, N.Y.

The first air crash occurred when a propeller broke in flight and sent the ship to the ground.

Undaunted, however, by the tragedy, the Wright Brothers, as soon as Orville was completely over his injury and could go back to work, set out to make another plane that would be acceptable for the air corps. It was just one year later that they made their tests before President Taft and members of the Acceptance Board from the Signal Corps.

As a member of the board Col. Lahm, then a Lieut., watched closely the results of the various tests. He was later to become the first officer to fly in an "army plane" inasmuch as he had learned in the plane after it had been purchased from the Wrights and had become government property.

For the speed trials there was a series of captive balloons set up over a five-mile course from Fort Meyer to Alexandria. Orville was at the controls when the ship took-off and it disappeared beyond some hills and trees causing great anxiety among the spectators, but finally it appeared and the time keepers, one of whom was Wilbur Wright, announced the ship had passed the acceptance test.

Following the speed trials Col. Lahn went aloft with Orville for the endurance test. They remained in the air one hour, twelve minutes, to establish a world's record at that time.

After the tests were completed and the plane purchased by the government it was necessary to train members of the Signal Corps, which had been designated as the aviation section of the army, to fly the ship. Wilbur and Orville Wright were both instructors and Lahm and Humphries were their first students.

The army moved the plane to College Park, Maryland, built a shed to house it and set up a pylon and track so that instruction could begin.

It was a difficult task to learn in that early plane, but both officers soloed within a few minutes of each other, little more than two weeks after the instruction began.

One thing they didn't have to contend with was instruments because flying at that time was primarily a matter of keeping the machine balanced. There were no instruments except a piece of tape attached to the cross-piece of the landing skids. If the piece blew out straight on turns during flight, the plane's occupants knew everything was progressing well. If it blew at an angle, the pilot knew he was skidding and should bank more carefully.

Today pilots in training at Randolph Field spend many hours on the ground learning about the various instruments which make modern flight safer. The instrument panel of the modern bomber, pursuit or airliner with its many tachometers, altimeters, speedometers, gauges and thousand-and-one mechanisms is representative of the progress made since that first military airplane.

These many instruments today, however, are designed to keep the ship on its course on long distance flights, to determine its climb and altitude and the general all-around performance. They are an important part of an accepted thing, for aviation is here and here to stay. But that piece of tape was a part of a machine which was yet in its experimental stages.

However, Col. Lahm admits that the first plane could be landed more easily than the ships of today. This, he explains, was due to the fact that the framework undercarriage allowed the pilot to see the ground in landing and thus the plane could be brought to within an inch of the ground and glide along without touching.

War Brings Progress Rapidly

The Wright Brothers were paid $25,000 for their first plane but not until March 3rd, 1911, did Congress specifically appropriate money for aviation—$125,000. By September 30th, two years later, army aviation had grown to 17 airplanes, with a personnel of 23 officers and 91 enlisted men.

From the two early aviators to an army of 18,000 the warbirds grew and with them the planes they flew.

"The World War gave great impetus to motor development," Orville Wright says today. "The need for aircraft during the war drove the world far ahead in its knowledge of aerodynamics."

The Spirit of Wright

Now we are living in the midst of the greatest armament race since the war and of first importance to every nation is the plan to increase its air power. The airplane has proven itself an invaluable weapon of defense. Land and marine forces have been rendered practically useless without its aid. Aviation has changed the tactics of warfare.

"Supremacy of the air" is the aim of every nation of importance today. The United States, England, France, Russia, Germany and Italy—the six great powers in the world—are building planes and more planes to aid their defensive and offensive military organizations.

While all of this is making the headlines

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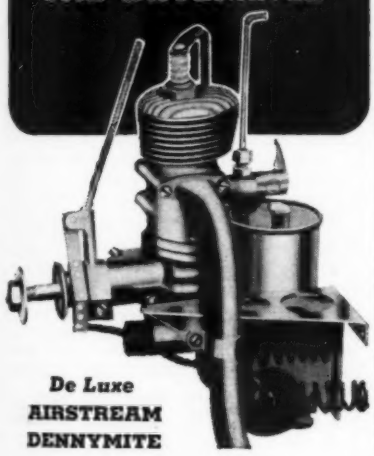

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of the newspapers read like the script book, setting the stage for war, there is one man who looks back on the past quarter of a century (which might rightfully be called the Era of Flight) with sorrow and disgust in his reminiscence.

Today the 68 year-old co-inventor of the airplane, Orville Wright, would like to tell the world that he is sorry "we did it" since everyone has taken the airplane too much to heart as strictly a military machine.

In a recent interview prior to the 35th year celebration of the first flight at Kitty Hawk he told reporters, "Although we thought of the military application, we believed airplanes would be used in the main for scouting over enemy territory. If planes were to be utilized for warfare we felt they would bring the fear of war home to the warring nations by bringing the actual combat closer to home. In this way we thought the airplane might tend to bring about peace."

"We didn't foresee the great planes of today because of the dangers of motor failure at that time," the silver-haired co-inventor says.

"It has been said," Mr. Wright often has declared, "that the airplane evolved because of progress in motor design, but this is not so."

He points to three distinct phases in aviation's growth: (1) The importance of pioneering in the science of aerodynamics which dictated the design of the first plane and all to follow (2) The motor and structural improvement and navigation aids. (3) The revival of aerodynamic experiments and their practical application.

"Right now experimenters are seeking to eliminate surface eddies, to avoid any slight projection that hinders the smooth flow of air. Even a protruding obstacle of hair-line slimness causes a major waste of power." This from the man who started it all.

He predicts that future application of this method of eliminating all obstacles from the air flow of the plane would aid in attaining faster speeds.

"We weren't bothered much about streamlining in the early days," he added, "Our only streamline problem was lying down instead of sitting up against the ocean gales."

Mr. Wright feels that the recent radio "echo" device which enables the pilot to determine his actual height from the earth's surface is one of the outstanding navigation aids in recent years.

Recently he boarded the large Douglas DC-4 transport plane for his first flight in ten years.

When he came down he made the comment:

"It's a wonderful plane. I can't believe that there is so much money wrapped up in a plane of this size—more than $2,000,000."

And so it must have been on Aviation Day when Maj. Arnold and the old timers got together to celebrate the 30th anniversary of the U.S. Air Corps. Those zooming planes and their roaring motors beat out a rhythmic story of progress.

These planes were nothing new to the citizens of Dayton for everyday new planes, the very latest of Uncle Sam's warbirds roar over head. Each day and night the commercial airliners fly over this Gem City of Ohio where lives the one man who prob-

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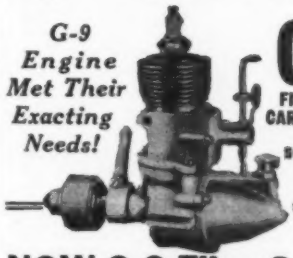
G-9 Engine Met Their Exacting Needs!



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For vitally important Anti-Aircraft Maneuvers, this South American nation demanded the most accurately-performing engines for their model planes! After exhaustive tests, their technicians selected G-9 as most representative of "the real thing!" Thus, the fine G-9 comes through with flying honors—if it's performance that counts with you, too, you'll find "G-9" tops!

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Engineers, Technicians, Aviators —men who know! —and have tried all!, their final choice is "G-9." Remains without equal for performance and economy!

In this IMP "G-9" you own the perfected airplane power plant of tomorrow! it's got everything! Lift, thrust, drive, power to spare! Throttle it down for use on 40' models or, with slight adjustment, it lifts and flies a 12 pound, miniature sky-giant—up to 15 ft. (180 inch!) wingspan with standard wing loading. Radically improved port system plus fingertip carburetion are exclusive features of "G-9". Unstalling, unfailing performance regardless of mount. Complete with Coil, condenser and Champion Spark Plug. On Test Block $10.00

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SPECIFICATIONS: Wt. bare 9 oz. Bore 7/8". Stroke 15/16". H.P. 1/4 plus. R.P.M. 300 to 7000 with 13" prop, up to 10,000 with flywheel. G-9 will outperform engines selling up to $20 ON A MONEY-BACK BASIS! There is none finer made at any price—it's magnificent value!

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7 Rust-resistant, easily sharpened, interchangeable Cutters

ESPECIALLY MADE FOR THE MODELLER!

COMPLETE OUTFIT 50c

International introduces this sensational 7-in-1 cutter for Model Airplane, Shipmaking and Craft work. A perfect tool for Balsa and similar surfaces. England's Finest Sheffield Steel. Hand ground and sharpened. Includes: General Purpose (accurate angling); Diamond-Point Parting; Rebate Cutter; "V" Groove Veiner; Forward-Cut Gouge; Back-Cut Gouge; Square-Cut Gouge and Special "Kantslip" Holder. Additional blades only 3 for 25c. Each set, including handle and 7 blades packed in attractive, simulated wood box.

DEALERS NOTE: "Studiette" is attractively packed in 2 pieces, simulated wood, individual carton.

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BUD WARREN Says:

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ably knows and feels the story of man's conquest of the air more than anyone else. He is Orville Wright and his silver-grey hair and steel blue eyes reveal that he is no longer as active as he once was for he spends less time in his library compiling the records of his life. But with these ships as they disappear into the horizon, go the thoughts of this man who has seen and lived through this era of flight: FROM CRATE TO FLYING FORTRESS!

A Four Foot Westerner

(Continued from page 26)

at the tip, proceed to install and cement wing ribs W-4 to W-11 in place. The trailing edge gussets are 1/4" x 3/8" in size and are made from 1/16" sheet balsa. After installing them follow with the wing tip which is cemented in position, with 1/16" sheet balsa bracing on the top and bottom. When the wing structure is completed, proceed to cover the front portion with 1/64" sheet balsa, as indicated. A piece 2-3/4" x 6" is required for the center section while two pieces, each size 2" x 2-3/4" x 18-3/4" will be needed for the left and right wing panels, between ribs W-3 and W-10. The portion remaining from rib W-10 to the tip is covered with two small pieces. In laying the balsa veneer on, start by making a line of pencil marks across the tops of the ribs which will show the position of the rear edge of the veneer, on the top side. Apply cement to these rib portions and lay on the sheet, using pins to hold until dry. When set, moisten the sheet balsa with water where it is to be pulled over the leading edge proper, or the sharpest bend to be made with it. Proceed to bend it on over and pin it underneath along the whole panel, as you did on the top. Cement is next applied between the veneer and the rib sides at every rib. Be certain that the veneer follows the rib contours, by stretching it tightly. From 1/32" thick sheet aluminum, cut and install the four wing strut plates on wing ribs W-2 as shown. A hole a trifle larger than the wing strut wire is drilled in each. Use plenty of metallic cement in securing them in place. The wing unit is now completed, ready for covering.

Tail Surfaces

The empennage is of simple construction. Begin by forming all of the parts, ready to assemble. The fin, stabilizer, leading and trailing edges are 1/16" x 1/4" balsa and all ribs are of 1/16" sheet balsa except fin rib F-4, which is 1/8" sheet. The stabilizer and fin tips are also of 1/16" sheet balsa, and the main spars for each surface are cut from 1/8" sheet balsa. Both the stabilizer and fin are of the same type construction. To build the stabilizer, lay the spar down first, followed by the leading and trailing edges. At stabilizer rib S-5, block the spar up 1/8" and raise the leading and trailing edges 7/32" from the work table. Install the ribs and cement in position. Cut two pieces of 1/8" sheet balsa and cement well between ribs S-1 as shown. The dress snaps which hold the tail surfaces in place are mounted on one of these two sheet balsa fillers. Use an ample quantity of metallic cement to install the other three halves of the No. 0 size dress snaps.

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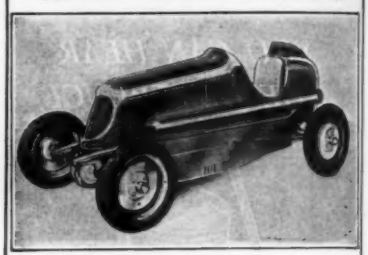

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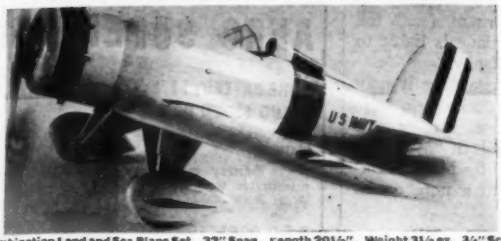
NEW LOCKHEED P23A NAVY FIGHTER



Combination Land and Sea Plane Set. 32" Span. Length 20½". Weight 31½ oz. ¾" Scale Model will rise from land or water in few feet. Construction set contains fuselage and pontoon formers, wing ribs, tips, etc., printed on balsa, a 3⅜" turned cowl front, 2 instrument boards, colored insignia, lettering, windshields, 9" carved scale flying prop shown, 3 oz. silver paint, 1 oz. cement, 1/2 oz. black, 2 oz. glue, ready cut wheel pants, strong 2" aluminum wheels, 12 feet of rubber, and large 33" x 44" drawing of land and sea plane. This is a sensational model and only one of its type in the world. Construction Set in labeled gift box, postpaid..... $2.95

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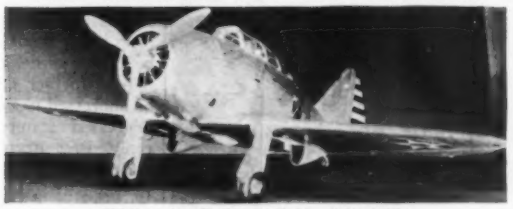

32" Span, Length 25", 1" Scale. Color, Silver

A brand new model of the 1938 Bendix Trophy Winner P 35. Set has 4" turned balsa motor front, 10" carved prop, balsa wheels, tail wheel, rubber, all parts printed on balsa, 3 oz. silver dope, ½ oz. black, 2 oz. glue, etc., insignia, and full size scale drawing. Const. set in labeled gift box, postpaid..... $3.25

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Set has turned motor front, all parts printed on balsa, colored paints, 11" prop shown, full size drawing. A wonderful flyer. Set, postpaid..... $4.25

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Set has turned motor front, set of paints, glue all parts printed on balsa, and full size drawing. Set, postpaid..... $3.25

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50" Span. Color, blue and yellow

Set has printed parts, complete set of paints, etc. Set without motor, prop, or wheels, postpaid..... $4.95

BOEING F4B4 NAVY FIGHTER

22½" Span. Length 14½". ¾" Scale

Set has 3" celluloid motor, 31¼" tapered aluminum cowl ring, set of paints, etc. Postpaid..... $2.95

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When the basic construction of the fin is completed connect the tab with the fin by means of small copper or iron wire hinges. The tail surfaces are completed by covering both the stabilizer and fin leading edges with 1/64" sheet balsa, done in the same way as that on the wing.

Covering

The original model was covered with Mino Tissue, which is the cream-colored "natural" paper sold for rubber powered model aircraft. It has watermarked parallel lines running through the sheet about an inch apart, and with that description anyone building this ship can easily procure it if it isn't sold under the name of "Mino." It is ideal for the covering material for this small light gas job. Cover the wing, tail surfaces and fuselage in the conventional manner and water-shrink the covering. When dry, cement the fin to the stabilizer very securely, making sure both are at right angles. Remove the paper over the center of the stabilizer, in cementing the fin, to insure for a strong joint. Dope the entire model with two coats of clear dope and follow with two coats of pigmented dope (sprayed if possible) in a color or colors of your own choice. The original was first painted a vivid orange and later a bright yellow with black trim, both equally effective.

Assembly and Flying

First install the motor on the motor mounting plates. Then remove the top section of the fuselage and lay the wing cradle across the main longerons. Secure it with 1/8" flat rubber making it just tight enough so that it may be adjusted on the ground but can't shift in flight. Install the battery in its holder just ahead of the cockpit. Connect the rubber gas line to the carburetor (if using gravity feed) and lead it through the top section of the fuselage, followed by the snapping of this removable unit into place. Connect the other end of the gas line to the wing tank, after springing the wing into position in the support for it. The tail surfaces are snapped on and it is ready to balance. Supporting the ship by the fingertips about 40% back from the wing center section chord, adjust the wing back or forth until the plane balances with the nose slightly down. Before test-hopping under power, it can be safely hand glided to insure for maximum gliding performance on the first powered flight, if desired.

Although the original ship was flown on limited motor runs of about 30-40 seconds by clipping the gas line shut behind the carburetor, some builders may desire to install a mechanical timer such as the Autoknips, etc., the installation of which the writer leaves to their own ingenuity. (Timers, as used today, were hardly known or thought of at the time this model was designed.)

In test flying, throttle the engine down to about half speed and allow it to take off under its own power, flying in no wind

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if possible. Set the timer or gas shut-off for about 20-25 seconds. After initial hops, if all is satisfactory the engine may be revved up to its maximum r.p.m. (with the prop being used) and the plane is liable to be "gone with the wind" if any.

Any further questions regarding it may be addressed to the author, enclosing a self-addressed stamped envelope for prompt reply. Photographs of models of "Miss San Diego" would be welcomed by MODEL AIRPLANE NEWS, together with a note on its performance.

Falcon of France

(Continued from page 23)

he shattered the designer's art is widely open to debate. The French today are having great difficulty building their planes but their designs, those on the draftsmen's table, are certainly on a plane with those of the rest of the world. Particularly so is the layout of the Potez 63, a simple, clean and fast three-place triple-purpose monoplane, and in its simplicity lies its revolt from native design, for late French creations have been marvels of erratic, unsymmetrical and ugly creation.

It is a low-wing full cantilever monoplane of all-metal construction featuring a "hi-low" fuselage-engine nacelle arrangement and dihedralled horizontal stabilizers, one of the first ships in the world to use them.

The wing center section is built integral with the fuselage. The highly tapered outer wing panels are built up on two heavy spars composed of duraluminum angle booms and duraluminum sheet webs varying in thickness along the span towards the tips. The wing leading edge is detachable as are the tips for either shipment or inspection purposes. The entire wing structure is flush riveted sheet dural making a smooth, clean surface throughout. The ailerons are carried on the outer panels in conventional manner with flaps of the split trailing-edge type being carried along the center section and out to the ailerons on either side.

The fuselage is extremely narrow and lithe and tapers to a neatly pointed nose. The crew is carried high and well forward in an open tandem cabin enclosed by sliding glass panels. The fuselage proper is divided into three sections; the central section, enclosing the acommodations, is made up of four angle longerons to which are attached the four separately-built stressed skin side, upper and lower panels. The nose and rear sections are monocoque made in halves and joined along the upper and lower center-lines. These are built up of semi-rings, longitudinal members and stressed skin. They are joined together by gusset-plates and thin sheet longitudinal panels covering the joints.

The unique tail surfaces are of the monoplane type with twin fins and rudders. The horizontal tail surfaces are made in two sections joined to the fuselage at a heavy dihedral angle. These are built up in a manner similar to the wings. The vertical surfaces are semi-elliptical in plan form and are unbalanced.

The landing gear is complicated but safe and efficient. Each unit consists of two Messier shock-absorber legs between which is mounted the wheel, and two rearwardly

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All M & M wheels can be inflated and deflated

inclined legs hinged in the middle. These joints are broken upwards hydraulically to raise the wheels backwards and into the tails of the engine nacelles. The opening is then covered by large metal plates attached to the forward portion of each wheel.

Power is supplied by two Hispano-Suiza 14Hbs radial double-row air-cooled engines rated at 670 horsepower at 3,500 meters (11,480 feet). These drive three-bladed Hispano-Hamilton controllable pitch propellers built under Hamilton license in the Hispano-Suiza works at Bois-Colombes. These are enclosed in snug-fitting nose-spinners. The engines are encased in special long-chord spun metal cowls with controllable cooling flaps on the rear portion. The oil cooler is located on the bottom of the standard model and on top in the ships fitted with supercharging equipment.

Fuel tanks are carried entirely within the wing and have a gross capacity of 530 litres. The oil tanks are carried within the engine nacelles and have a capacity of 35 litres.

The Potez 63 can be converted into any of three different categories of operation; as the C.3 it functions as a three-seater hi-speed fighter, as the B.2 it functions as a two-place heavy bomber and as the R.3 it functions as an observation machine.

The cabin is completely enclosed through the use of sliding glass hatches. The pilot sits forward of the leading edge of the wing, the rear gunner aft of the trailing edge with provisions for a navigator in between. Standard equipment includes full instrument and electrical equipment, oxygen and parachutes. The C.3 armament consists of two 20 millimeter cannons mounted in long-narrow implacements beneath the fuselage just under the pilot firing forward and one movable machine gun in the rear gunner's cockpit. Equipment includes radio and large ammunition supply. The B.2 is fitted with an internal bomb cell for eight 56 kg. (124 pounds) bombs which replaces the third member of the crew. Armament consists of one fixed machine-gun in the nose and one flexible gun in the gunner's pit. Equipment includes radio, bomb-sights and releases and various bombing paraphernalia.

The R.3 carries three members of the crew with armament same as for the B.2. As an observation and spotting machine a special camera is enclosed in a faired substructure mounted just below the fuselage and is operated by the navigator.

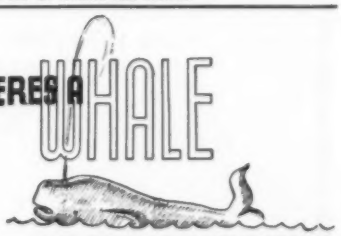
The Potez 63 has a wing-span of 52 feet, 6 inches; a length of 36 feet, 3 inches and is 9 feet, 10 inches high. It has a wing area of 355 square feet.

The C.3-Fighter has a weight, empty, of 5,588 pounds, miscellaneous equipment, 405 pounds; fuel and oil, 924 pounds; military load, 1,298 pounds; gross weight, fully loaded, 8,215 pounds.

The B.2-Bomber has a weight empty of 5,588 pounds; miscellaneous equipment, 361 pounds; fuel and oil, 1,430 pounds; military load, 1,804 pounds; gross weight, fully loaded, 9,183 pounds.

The R.3-Reconnaissance has a weight empty of 5,588 pounds; miscellaneous equipment, 429 pounds; fuel and oil, 924 pounds; military load, 1,188 pounds; gross weight, fully loaded, 8,129 pounds.

THERE'S A WHALE



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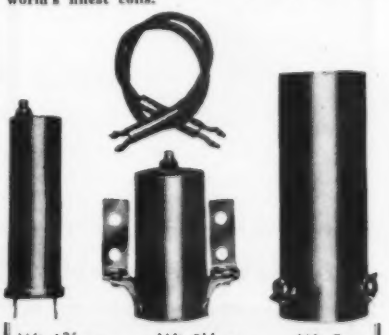

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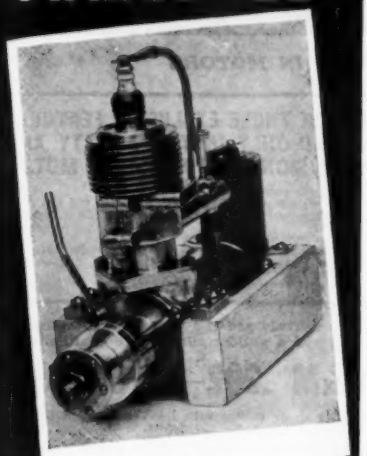

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The 3-Fighter has a top speed at 13,120 feet of 285.6 miles per hour, a cruising speed of 248.7 miles per hour and it climbs to this altitude in eight minutes. It has an absolute ceiling of 32,800 feet and can climb to 13,120 feet on one engine. It has a cruising range of 620 miles.

The B.2-Bomber has a top speed at 13,120 feet of 279.4 miles per hour, a cruising speed of 236.5 miles per hour. It has an absolute ceiling of 29,520 meet and a cruising range of 807 miles.

The R.3-Reconnaissance has a top speed at 13,120 feet of 267 miles per hour, an absolute ceiling of 32,800 feet and a cruising range of 620 miles.

These figures are phenomenal performance when it is considered that the Potez 63 has a top speed of roughly 300 miles per hour and a ceiling of 33,000 feet, this on two 670 horsepower motors.

Over two hundred Potez 63's have been built to date, fifty in the S.N.C.A.S.E. plant and one hundred and fifty in the S.N.C.A.N. (Potez) plant with as many more scheduled to be completed soon.

The first complement of these ships, which appeared in the summer of 1938, were involved in a series of remarkable occurrences which were near history-making at the time. The first experimental test ship was delivered to Velizy-Villacoublay Air Field early in May, 1938. At this time conditions in Europe were no less tense than they are today and they had that fearful mystery to them of not knowing in which direction Herr Hitler would strike. The test pilot, Flight-Captain Armand Daladier, a distant-cousin of the present Premier, took the ship up for a brief early morning routine test flight. He donned his oxygen mask as he climbed and at about twenty-five thousand feet he leveled out and headed east with the throttle wide open. With a good tail wind he was speeding along at about 320 miles per hour. Velizy-Villacoublay Airdrome is located 6 kms. southeast of Versailles, or about 15 kms. southwest of Paris. Now Frankfort, Germany is only three hundred miles east of Paris and when about twenty miles from this fortified city, already sixty miles into German territory, Pilot Daladier was startled out of a semi-drowse by the sound of heavy explosions nearby. He raised himself up and saw heavy puffs of smoke about five thousand feet below him. In an instant he had surmised what had happened, turned about and was racing back into France. His gas had run too low to make his home port and he was forced to land at the airport at Verdun where he spent the night. Upon landing he stated that he had not realized he was traveling so fast, the airspeed indicator having been sealed for the regulation test flight.

"I would have covered only half the distance and still been well within France in any other service ship I have flown," he explained.

The other incident has to do with the delivery flight of the first three production models from St. Etienne to Villacoublay. On the way the three test pilots decided to make a race of it and opened their throttles wide. After a short period of screaming along at near the three hundred miles per hour mark they suddenly began passing planes which they recognized instantly as the special speed planes of the annual Marseilles-Paris Air Race. Within ten minutes they had passed the entire field, the winning plane included, and had landed in Paris before the first of the racers appeared over the finish line.

Build A Model Potez 63

For sheer beauty and trimness of outline this month's model is hard to beat. Purchase balsa blocks sufficient for the fuselage and engine nacelles and sheet balsa for the wings and tail surfaces. Several lengths of bamboo will be necessary for use on the landing gear struts and crew hatches. Cost should not exceed ten or fifteen cents.

Cut the various pieces to shape, sand them and apply our new silhouette templates for accuracy of cross-section. The wing is best made in three pieces, the horizontal stabilizer in two. Assemble the various components and mark details in black India ink. The ship should be painted in its natural aluminum shade with black tires, engines and tail wheel. The rudder and wing insigne are painted alternate red-white-and-blue as shown. Use cellophane for the hatches built up on a framework of bamboo or small wire. Your model is then complete and you have a faithful reproduction in miniature of the Potez 63, "Falcon of France."

Frontiers of Aviation

(Continued from page 15)

Remember it? We are glad to see that England is putting out the "real stuff" now, and many more exceptional aircraft will be forthcoming from that country shortly.

The wing span is 127 ft. and length 89 ft. The gross weight is 71,000 lb., and the wing loading is 40 lb./sq. ft. which seems a bit optimistic. About 3,400 miles will be the cruising range.

Following is the result of a little snooping:

	Top Speed	Climb	Range
Hawker Hurricane	330 m.p.h.	6.3	850 mi.
Vickers Wellington	257 m.p.h.	20.5	3,240 mi.

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Is Now Equipped with FOUR NEW 1940 IMPROVED FEATURES

1. NEW! ONE-PIECE Aluminum CHASSIS (Factory Drilled and Tapped) Guarantees Perfect Rigidity; Complete with Motor Mounts, Etc.
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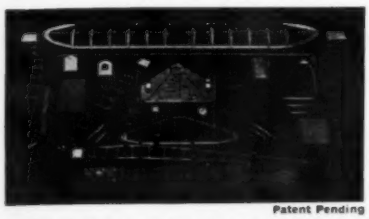

Patent Pending

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WITEAGLE 48"	gas powered model less wheels, prop. and motor	$3.95
WITHAWK 32"	rubber powered cabin model	$2.95
WITBIRD 22"	rubber powered cabin model	$2.35
WITMASTER 30"	rubber powered contest model	$1.95
WITRAINER 18"	rubber powered contest model	$1.50
WITFLY 18"	rubber powered contest model	$1.00

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All engineering and design under direction of B. Russell (Russ) Shaw, Early Bird, and former chief designer for Wright Brothers.

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THE WITRAINER $5.00 CASH PRIZE

THE WITFLY $5.00 CASH PRIZE

Winners' pictures will be published in this magazine.

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DEALERS: Send for prices and merchandising plan

DESIGNERS OF THE AIR-TRACK RADIO SAFE LANDING SYSTEM AND OTHER INTERNATIONALLY KNOWN RADIO AND FLYING AIDS

No more news has been forthcoming in regards to England's attempt to gain the world speed record, but we hear that Dewoitine of France is busy on a plane to break the record now held by the German Messerschmitt.

$2,103,800 is what the navy is paying for a fleet of new spot-welded Vought-Sikorsky scout observation seaplanes. This method of construction permits a very smooth outside skin covering, there being no rivet heads to stir up parasite drag. Though spot-welding has already been used for some time by many manufacturers in the construction of non-structural parts such as cockpit enclosure frames, baggage compartments, engine cowlings, parachute flare racks, etc., this is the first modern airplane purchased by the navy using spot-welding extensively. This method offers light-weight construction and it was probably this feature that meant the winning or losing of the contract for Vought-Sikorsky. The navy wanted a comparatively large airplane with a small amount of horsepower, and to design such an airplane that would consistently take off the water under varied conditions and still maintain high performance is a problem.

The Vought-Sikorsky is powered with only a 400 hp. nine-cylinder Pratt & Whitney Wasp which does not eat up the fuel as do the higher horsepower engines; thus an appreciable range is obtained for scout work for which the airplane is primarily designed. It makes a good general purpose airplane for the navy to keep its pilots in trim. Under their handling the spot-welding will certainly be given a thorough test and if it holds up after they get through bouncing them about in the salt water, this spot-welding business will be worth looking into. In the case of the Vought-Sikorsky aluminum alloy primary structures are spot-welded.

The OS2U-1 has an overall span of 36 feet with a length of 33 feet, 10 inches as a seaplane and 30 feet, 1 inch as a landplane. Gross weight as a seaplane is 4,764 pounds and as a landplane 4,542 pounds which is extraordinarily light for a two-place scout-observation seaplane. Of course the interesting information as to how fast the airplane goes is kept hidden in the navy's filing cabinet. In general appearance the airplane resembles the low-wing scout-bomber landplane that Vought produced last year. This plane however is a mid-wing and its single main float is attached to the bottom of the fuselage by only two wire-braced struts. Wing floats are very obvious near the tips. The enclosure flows neatly into the aft portion of the fuselage, there being no break in contour at the rear. The glass enclosure on the rear cockpit is long enough to permit the co-pilot to stretch out and take a sun bath. Visibility is certainly not lacking.

But the big feature on these seaplanes is the use of slotted "deflector plate" flaps and "drooping" ailerons to add to the flaps area. To supplement the ailerons when landing, "spoilers" in the wings are used. All this results in slow landing speed and permits high wing loading.

OHLSSON 23

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Recent tests on a Strobo-tach (R.P.M. measuring machine) built by General Radio Co., used by all major airplane companies showed that, with a 12" Heathe Propeller and standard 4 to 1 mixture, the Ranger turned over 5700 R.P.M. The same test applied to another make motor showed 5100 R.P.M., and to a third make motor only 4800 R.P.M.

The Ranger has that extra amount of power that can make any ordinary ship a surefire contest winner. For higher altitudes, write for full particulars—or better yet, come in and watch a free demonstration.

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each kit complete wih all necessary parts; with Aluminum Cowl, Carved Prop, Full size plans, Colored Paper and parts to spare. All parts printed on balsa. Easy to assemble, easy to fly. The most for your money in a dollar kit.

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1/16x1/8	35—5c
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1/8x1/4	15—5c
3/16x3/16	8—5c
1/4x1/4	6—5c
1/4x1/2	3—5c

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1/64x2	4—10c
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1/16x2	4—10c
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1/8x2	6—10c
3/16x2	3—9c
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3" sheets or 36" lengths, double above prices; add 10c for package charge for 36" lengths.

PROP BLOCKS

1/2x3/4x6	6—5c
5/8x1x8	3—5c
3/4x1 1/4x10	3c ea.
3/4x1 1/4x12	3c ea.

WASHERS

1 doz. 1/8 or 1/4 1c

18" PLANKS

1x1	5c;	1/2x2	6c
1x1 1/2	9c;	1x2	10c
1x3	15c;	2x2	18c
2x3	25c;	2x6	30c
3x3	40c;	3x6	75c

BAMBOO

1/16 sq. x14 35 for 5c

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COLORLESS CEMENT

1 oz. 5c; 2 oz. 9c
4 oz. 16c;
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Clear dope, banana oil, thinner, same price as cement.

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White, yellow, orange, blue, red, green, olive drab, black, silver, gold or gray.

1 oz. 6; 2 oz. 10
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1/2"	.01	.03
3/4"	.02	.04 .05
1"	.03	.05 .07
1 1/2"	.04	.08 .10
1 3/4"	.07	.10 .16
2"	.15	.15 .30

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1 sheet..... .05

TISSUE, AA

All col., doz. 10c
Superlite, white, 1 doz. 15c

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1/16, 3/32, 1/8, 1 ft., 7c
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Balsa Mach Cut	Faulowina
5"— 4c	5c
6"— 5c	8c
7"— 6c	9c
8"— 7c	12c
9"— 8c	15c
10"— 8c	17c
12"—10c	22c
14"—14c	
15"—15c	35c

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Valuable premium Coupon with all orders.

More than 200 hours of test flying were given the airplane with much success. Though mainly designed as a seaplane, a landplane version has already been test flown. (See photo page 18, October 1938 issue of MODEL AIRPLANE NEWS.)

Since the builders of the Arrow Sport powered by the Ford V-8 engine have discontinued production of that airplane they have been working on a new ship, basically the same in design but with a Menasco engine up forward. Their aim is probably some of this government training business, as is the reason for many another small plane manufacturer.

It was good to see St. Louis get a contract after their many years in and out of the aviation industry. Their plane is a two-place biplane of metal construction and fabric covered. In the nose is a 225 hp. Whirlwind. It was flown by Harry H. McKay, vice-president of St. Louis Aircraft Corp., during tests to win an experimental order of about 13 ships from the government. The contract price was $139,419 for the fixed landing geared airplane. Cockpits are in tandem. Following is a list of the plane designations of airplanes recently purchased by the U. S. Army Air Corps:

Waco YPT-14 (Primary Trainer)
St. Louis YPT-15 (Primary Trainer)
Ryan YPT-16 (Primary Trainer)
Consolidated B-24 (Four-engined Bomber)
Lockheed YP-38 (Interceptor-pursuit)
Bell YP-39 (Interceptor-pursuit)
Curtiss P-40 (Interceptor-pursuit)
Seversky XP-41 (Interceptor pursuit)
Seversky YP-43 (Interceptor-pursuit)
Vultee YA-19 (Single-engined Attack-bomber)
Beechcraft F-2 (Twin-engined Photographic Plane)
North American BC-1A (Basic Combat)

Douglas's little twin-engined attack-bomber is all set to be wheeled out on to the field to go through test flights and a barrage of publicity once more. From the fleeting glimpse we had of the plane there seem to be no radical changes in lines. Los Angeles Municipal Airport, where the ships are to be tested, is at last having new runways installed, and is in no condition for the test hopping of the more than 300 attack-bombers now a-building. It will be interesting to see whether the attack-bombers or the tractors leveling the runways will win.

Barkley-Grow which is now in the midst of a spurt may come forth with something new.

Well, all the bids arrived at Dayton for the famous July competitions and no doubt the Air Corps has been sitting up nights wondering to whom to allot contracts. In the multi-place fighter class we hear that Bell was the only bidder, so they will not have much trouble deciding that one. However, news that leaks out on the bids is not altogether too authentic, so the following we will mark down as gossip with about 75% authenticity involved. It will nevertheless give one a good idea of what happened when the bids were opened for the $250,000,000 worth of aircraft and equipment. North American was the unquestionable low bidder on the light bomber competition with the others following in this order: Douglas (El Segundo Div.), Stearman, Martin, Vought-Sikorsky, Douglas (Santa Monica Div.) and Consolidated nip and tuck for the highest priced ships. Burnelli was also involved, but we are sorry to say that we have not as yet learned the amount of their bid. The airplanes will somewhat resemble the attack-bomber though slightly larger with two engines of around 2000 hp. each. Designs were sent in with the new Pratt & Whitney and Wright flat-type engines, Allison V and double V type engines, and Lycoming liquid-cooled engines. Their speeds will be top notch. For example, Douglas expects 390 m.p.h. from her turbo-supercharged DB-7 attack bomber, 63 of which are now on order. The remainder of the DB-7 order will be for plane un-supercharged but powered by engines of the R-2600 cu. in. displacement Twin-Row Wright Cyclones which are close to the 2000 hp. mark.

In the four-engined bomber class Boeing, Consolidated and Douglas did all the bidding. It is difficult to predict which company will win because all three are now busy on giant bombers for the U.S. Army Air Corps. There were also three bidders reported in the interceptor (twin-engined) competition, namely Lockheed, Bellanca and Burnelli. In the observation class North American Aviation, Inc. was the most outstanding. But as predicted, when it came to the training plane competitors there were droves of them. Here are some of them: Bellanca (low-winged Junior), Ryan (YPT-16), St. Louis, Porterfield, Monocoupe, Piper, Fletcher, Meyers, Waco, Fairchild, Brewster, Culver, Southern, Lenert, Cunningham, Vega, Stearman, St. Louis and Spartan.

In the past few years the light-plane builders, such as Piper and Luscombe, have been adding more horsepower to their planes with a resulting addition in price and now the light-plane has risen to the 75 hp. class with the advent of the Stinson "105." Porterfield steps in with an improved version of their Zephyr to once more produce the real low-priced light-plane. Now that Roscoe Turner has joined the company the airplane will be known as the Porterfield-Turner Model 50. It is a high-wing monoplane with tandem seating for the two passengers. The range is 250 miles powered by a 50 hp. Continental engine with fuel consumption 3.25 gallons per hour. Top

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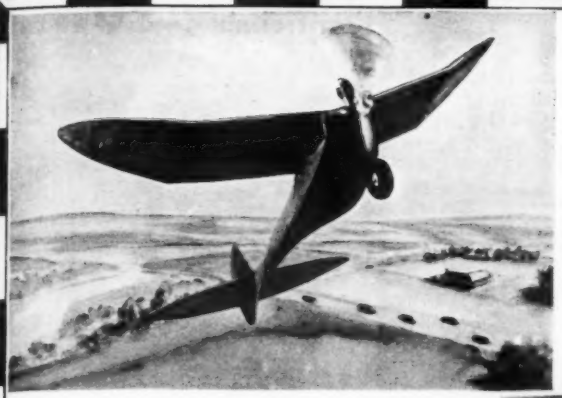

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SKY-ROCKET

After proving itself a champion performer at the Nationals, in which it made the longest official Class A flight of the meet, and after taking honors in every contest it has entered so far this year, the SKY-ROCKET has now been made available to the modeling public. A real performer for sport and contest work, this ship has been designed employing basic principles which have identified winners throughout the country. The originator of one-wheel gas models, high-lift airfoils and corkscrew climbs, Leon Shulman has built into this ship the secrets of his contest success. A ship with built-in flyability. A ship with CHAMPION PERFORMANCE.

Class B performance in a Class A ship! That's the way to best describe the SKY-ROCKET. Class A ships require innovations in design to give the utmost in flyability with sturdy construction and a minimum of weight. The Sky-Rocket kit has been scientifically developed to aid you in construction. Printed sheets—really clear on stock especially chosen for each individual purpose—are half the battle won. Felix Gilbert, nationally famous industrial designer, developed the plans which make construction of this ship a distinct pleasure. AIR WHEEL INCLUDED WITH EVERY KIT. Plenty of liquids, balsa accurately cut on Paramount's new automatic machines, paper, wire and all fittings. Complete kit at the startling price of ..... **$1.95** P.P.

Leon Shulman, at the head of research for Paramount laboratories, has been identified with design developments since his first acquaintance with the model hobby several years ago. His distinctive designs have been extensively copied throughout the world and the very success of these copies further proves the worth of the design. An older Shulman design, which incorporates basic features similar to those in the Sky-Rocket, took first in Class B at the twelfth National meet. Shulman's Sky-Rocket is the first Class A ship designed for a Class A motor. Build it and note the difference.

Paramount models are ZOOMING to the heights of model supremacy. Our present FIELD-PROVEN planes include the Commander—6 foot Class C beauty, listing at $5.50 for standard kit or $7.50 for DeLuxe kit with silk and air wheels. The Kestrel—50 inch Class B job is one of the best designed ships in its field at $2.95 for standard kit, $4.50 with silk and air wheels. Four foot Skipper Class B ship, differing in design, sells for the same price.

Dealers and modellers write for literature. New models, meeting all new classifications, are now under development and will present many startling innovations. Keep Your Eyes on PARAMOUNT!

PARAMOUNT MODEL AIRPLANES, 59-61 LIBERTY AVE., BROOKLYN, N. Y.

(California Distributor, RADIO ANALYSIS CO., 247 S. Robertson Ave., Beverly Hills, Calif.)

speed is 100 m.p.h., cruising speed 97 m.p.h. and landing speed 35 m.p.h. Porterfield's military entry was a biplane.

Two-in-One Engine Plane Makes First Flight

Successful completion of first flight tests of the new Vega Starliner has been announced by Mac Short, president of the Vega Airplane Company, a subsidiary of the Lockheed Aircraft Corporation. Initial flights were in charge of Vernon Dorrell, Vega test pilot, who reported that flight performance of the new model more than exceeded the expectations of designers. Upon completion of a week of "shake down" flights, the Starliner will be subjected to a rigorous 250 hour schedule of flight tests under all conditions preparatory to the granting of an Approved Type Certificate for the craft by the C.A.A.

One of the most interesting features of the plane is the Unitwin power plant. This two-in-one engine power plant is comprised of two separate inverted in-line, six-cylinder Monasco engines generating 260 hp. each, mounted side-by-side and geared to drive a single propeller. Each engine is controlled by an individual throttle and may be operated independently of the other without any drag being transmitted from the inoperative engine, in case one should fail. This, it is claimed by Vega engineers, gives the plane a tremendous safety margin.

The Vega is a six-plane low-wing monoplane with a top speed of 210 m.p.h. and a cruising speed of 184 miles an hour. Weighing 6000 pounds, the ship has a cruising range of 1,060 miles and a ceiling of 21,500 feet. Equipped with a tricycle landing gear the plane has a landing speed of only 61 m.p.h.

New Pratt & Whitney Engine in First Flight Tests

First flight tests of the powerful new Pratt & Whitney engine recently announced by the War Department, were successfully made last week at Rentschler Field, East Hartford. Installed in a Vultee airplane the engine was put through its paces in two flights totalling more than 3 hours, and performed faultlessly, according to Howard H. Sargent, test pilot.

Officials of the company revealed today that the 150-hour type test of the engine and its installation in the test airplane had been completed in record time to make the new powerplant available for possible use in the government expansion program. The 150-hour test, which culminated a two-year program of factory development and testing, was completed in only 198 hours actual elapsed time, the engine being run continuously day and night, stopping only at specified intervals for routine inspection and check. Despite this severe test of an entirely new design of engine, the run was completed without incident, and when the engine was disassembled after the test, careful inspection revealed it to be in perfect condition.

While the engine was being inspected, a Vultee airplane, equipped with a 1200-horsepower Twin Wasp engine was flown

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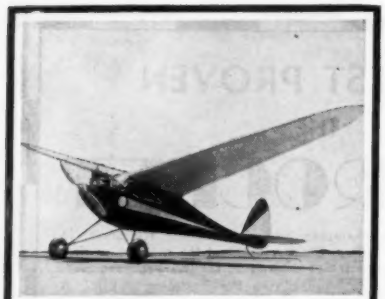

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SPECIFICATIONS

Flying weight with Dennymite motor 2 lbs. 14½ ozs., wing area 4 sq. ft., span 69⅞ in., modified Gottengin wing section, rate of climb 1600 ft. per min. with Dennymite motor, gliding ratio 19 to 1, flying speed 23.6 m.p.h., gliding speed 14.8 m.p.h.

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to Rentschler Field where a United Airports crew immediately removed the engine and prepared the airplane for its new powerplant. Just five days after the test engine was delivered to the hangar, Pilot Sargent took it off the ground for its first flight test. Company officials said that a double shift of pilots would be kept busy for several weeks to accelerate the flight tests.

Thirty Minutes Or Bust!

(Continued from page 8)

With a model of given external shape and fixed *total* weight the endurance is seen to be directly proportional to the rubber-weight ratio. Therefore, with outdoor models, where the minimum total weight is fixed by contest rules, the rubber-weight ratio should be made as great as possible.

In conjunction with this note three-view drawings of the author's push-pull outdoor stick model, 69% of whose total weight was rubber motor.

In the case of indoor models, the modeler is always building as light as possible and the question is how much rubber should be used to give maximum endurance. What we need is a formula in terms of the weight of the bare model, W_p, and the rubber-weight ratio, F.

Starting with the formula:

$$E = \frac{30{,}000 \times F \times N}{V_s}$$

we must express V_s in terms of F and W_p. From simple aerodynamic theory, we derive the fact that sinking speed is proportional to the square root of total weights.

Thus: $V_s = K\sqrt{W_t} = K\sqrt{W_p + W_r}$

Now: $F = \frac{W_r}{W_p + W_r}$ and $\frac{1}{F} = \frac{W_p + W_r}{W_r} = \frac{W_p}{W_r} + 1$

from this relation $\frac{W_p}{W_r} = \frac{1}{F} - 1$ Whence

$$W_r = \frac{W_p}{\frac{1}{F} - 1}$$

Substituting this in the expression for V_s we have

$$V_s = K\sqrt{W_p + W_r} = K\sqrt{W_p + \frac{W_p}{\frac{1}{F} - 1}}$$

$$K\sqrt{W_p\left(1 + \frac{1}{\frac{1}{F} - 1}\right)} =$$

$$= K\sqrt{W_p\left(\frac{\frac{1}{F} - 1}{\frac{1}{F} - 1} + \frac{1}{\frac{1}{F} - 1}\right)}$$

$$K\sqrt{\left(\frac{1}{F}\right)\left(\frac{1}{\frac{1}{F} - 1}\right)} =$$

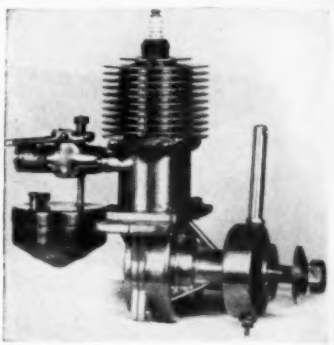
$$= K\sqrt{W_p}\sqrt{\frac{1}{1 - F}}$$

and substituting this in the expression for endurance

$$E = \frac{30{,}000 \times F \times N}{K\sqrt{W_p}\sqrt{\frac{1}{1-F}}} = \frac{30{,}000 \times F\sqrt{1-F}\,(N)}{K\sqrt{W_p}}$$

This is the desired expression in terms

smooth, controllable POWER



for "C" class planes, for radio controlled planes, for model race cars.

At the American Gas Model Meet at Chicago, July 23, a FORSTER powered ship easily walked off with first place. Mr. Alvin Anderson won first place in "C" class open, by a wide margin.

At the Detroit Nationals, Radio control division, Mr. Wasman and Mr. Respanti took second and third places respectively, with their FORSTER powered ships.

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of F and W_p.

From this we see that in any given model the endurance is proportional to the quantity $F\sqrt{1-F}$. If we make a graph of endurance for different values of F it is seen to be zero when F=0 or F=1, and to reach a maximum at the intermediate value F=2/3. In fact, by the use of calculus it is proven that this expression always reaches a maximum when F = exactly 2/3.

This means that the endurance of any model will continue to increase as more and more rubber is added, until the weight of rubber equals twice the weight of the bare model. Further addition of rubber will cause endurance to decrease.

It is interesting to note that most builders use a rubber-weight ratio of about 4/10 on their indoor models. In other words, the rubber they use weighs a little less than the bare model. This formula shows that by increasing the rubber-weight ratio to about 6/10 (that is, by using a motor 1½ times the weight of the model) about six minutes could be added to the theoretical endurance of their ships!

The same formula may be used to find how endurance varies with the weight of the bare model, when the rubber-weight ratio is held constant. By working out a typical example, it is found for a Class "C" indoor model, each additional thousandths of an ounce of weight detracts about forty seconds from the endurance. In order to make a Class "C" model of typical design fly for one hour, its weight would have to be about .022 ounces without the rubber. The theoretical endurance may be increased indefinitely by making the model lighter.

The manner in which duration depends on wing span may be investigated by the use of induced drag theory. We'll not hold up classwork to present it here—but take it from us, it leads to the conclusion that with present types of wing construction, large changes in aspect ratio result in comparatively small variations in endurance.

Thus the theoretical endurance of a Class "C" model is greatest with a wing span of about 34 inches, but it is only a minute less with a span of 28 or 40 inches. Below or above these, however, the duration begins to fall off rapidly.

So there you have it! "It" being a few well-founded facts that will enable you to make your contest modelcraft fly longer. In your haste to do 30 minutes, don't forget to cover the model!

Flash News

(Continued from page 30)

No single foreign aviation writer has ever caused such a perpetual stir among members of the American aviation press as Mr. C. G. Grey, editor of the esteemed *The Aeroplane*, famed British aviation weekly. His friends and enemies gathered into two armed camps for no man was indifferent to Grey, he either admired him whole-heartedly or despised him beyond contempt. One of the world's first aviation editors (1911), he learned aviation from his office window, seldom flew either as passenger or pilot, infrequently visited an airdrome, rarely examined a new model closely. But he was England's best informed aviation critic, largely through the use of a huge working staff and his own imagination. He never rode the fence on any question, spent most of his time on the other side for the sheer joy of being different. A pro-German and anti-American from the start he spent weeks of every year in Nazi-land inspecting, listening, but mostly openly admiring, praising and clicking his heels. Worst blow in recent years to him was the enormous purchases of American warplanes made by his government, a move he had fought tooth and nail. And now comes his passing from the post he has held for almost twenty years. For C. G. Grey has resigned as Editor of *The Aeroplane*. He will assume some other post surely, but for the time being all will be quiet on the foreign news front. He picked few individuals for comment but one so chosen was Model Airplane News' own Robert McLarren, who was the subject of a full column condemnation for the disclosure in our pages of inside information on one of Britain's late warplanes which C.G. himself had been unable to obtain. We shall not mourn his passing; only sit patiently waiting for British aviation's bad penny to turn up in some other vital spot soon.

—AMERICA FIRST IN THE AIR—

Seen at the Nationals

(Continued from page 20)

high powered planes and do not encourage the struggle for winning flights by study and application of aerodynamic design. These rules also encourage the building of models of a certain class rather than promote a broad scope of thought and design. It is to the advantage of model builders to have broad rules that do not limit or re-

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All you need's a pocket-knife. Figures stand 5" high. Completely moulded figure guides your carving.
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Precision-built by the world's largest maker of model gasoline motors

Transparent, unbreakable gas tank! New, improved timer! New steel crankshaft! New micrometer needle valve! All Brown Junior Motor prices include spark plug, coil and condenser. Completely assembled, ready-to-run. Model D—$12.50. Model B—$21.50. Model C—$18.50. Model M—$16.50. Junior Motors Corp., 2545 N. Broad St., Phila., Pa.

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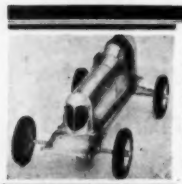

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THE FALCON

Wingspan 41" Bare Wt. 7 Oz.

★ PERFORMANCE • Weight less motor 7 oz. • Climbs like a rocket • Unexcelled all-round performance • 15 to 1 glide

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Full size detailed plan.

★ COMPLETE KIT with finished prop (less Air Wheels) $3.25. With M & M 2½" Air Wheels, $3.75. (Plus 20c postage.)

MOTORS SHIPPED POSTPAID

Ohlsson "23"	$16.50
Syncro Bee	$12.50
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Free with each of these motors 1 pt. 70 oil and 1 prop.

Brown B $21.50, Brown C $18.50, Brown D $12.50. Best SAE 70 Oil 35c pint postpaid. Modelcraft props: 11", 14" 25c each.

Add 10c for post. on props

FALCON AIRCRAFT

55 Poplar St., Southbridge, Mass.

strict the helpful experimental advantages that the model plane hobby offers to everyone.

We sincerely hope, for the good of all model America, that such rules will be established: rules that will encourage them along the lines of aerodynamics and how to use these factors to obtain the greatest amount of efficiency. These are the factors to which large airplane designers must give the greatest consideration.

Following such a course will help to develop a vast store of useful knowledge and understanding of aeronautical engineering principles. This will help to give all model builders a "head start" along the road to success in aviation.

A rather outstanding type of plane, of which a number was at the contest, was that which employed a parasol stabilizer. Picture No. 5 shows a rubber model embodying this feature. The use of this type of tail plane is usually the result of experiment, rather than an analysis of the problem. It is used merely because the builder finds he obtains better results with it.

It is always interesting to know why things occur, so suppose we try to analyze why the action of such a stabilizer is helpful. Usually in level flight there is a slight negative pressure on the stabilizer or practically no pressure at all. Thus in level flight such a stabilizer will have very little effect in respect to its particular position. However when the ship starts to climb or approaches the stalling point there is a decided lift reaction on it. Now, what kind of condition have we here? It is evident that the resultant lift of the two combined lift forces on the wing and stabilizer is acting at a higher point under these conditions than if the stabilizer was located at a point nearer the lower part of the fin.

In this we have the effect of a high center of lift in the climbing or stalling position and a resultant increase in the stability when the plane is in such positions; this stability resulting from the relative positions of the center of lift and the center of gravity. Translated in terms of performance, this means that the plane will hang in the air when climbing or stalling and will have less tendency to fall off sideways, spin or do other erratic maneuvers than ships, the stabilizers of which may be located in relatively low positions. This is the way we would analyze the situation. Possibly someone else may have some other ideas to suggest.

The time has come when folding props have definitely replaced the rigid blade variety in contest work, so that today machines with rigid props cannot hope to compete with the ones which employ this unique mechanism. Ships using this type of propeller predominated at the meet. The plane in picture No. 6 is a well designed monocoque fuselage. However this type of fuselage seems to be on the wane, inasmuch as it is exceedingly heavy. Apparently sufficient strength can be built into fuselages of the frame, paper-covered variety which are extremely light. Picture No. 7 shows another version of the monocoque fuselage type of model.

The tendency to freak designs has not invaded the indoor field to the extent it has in the case of the outdoor models. However, an unusual ship is shown in picture No. 8 with a nacelle or "bulb" type fuselage model. The builder of this ship evidently believes that the importance of the extra drag incurred by the short stubby fuselage model has far less bad effect on the flight of the ship than the extra weight of the long fuselage which would be necessary in order to give this part of the ship better streamlines. We think that possibly he is very wise in this procedure inasmuch as the streamlining of parts on indoor ships is not very important due to the slow speed with which they fly.

One of the finest designed ships at the contest appears in picture No. 9. Many planes employed the feature of twin rudders, shown here. They seem to have a very steady effect on any model. Being located at the ends of the stabilizer they prevent

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1/16 x 1/8	.20
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3/32 sq.	.25
1/8 sq.	.30
1/8 x 1/4	.35
3/16 sq.	.50
1/4 sq., 100 for	.50
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1 sq., 8 for	.25

18" Sheets Per 20

1/32 x 2	.15
1/16 x 2	.18
1/16 x 3	.36
3/32 x 2	.21
3/32 x 3	.42
1/8 x 2	.23
1/8 x 3	.46
1/4 x 2	.42
1/4 x 3	.84
1/2 x 2	.75
1/2 x 3, 10 for	.75

18" Planks

1 x 1½ each	.05
1 x 2 each	.08
1 x 3 each	.10
1 x 6 each	.18
2 x 2 each	.13
2 x 3 each	.18
2 x 4 each	.23
2 x 6 each	.30
3 x 6 each	.70

Balsa Prop. Blocks Per Doz.

¼ x ¾ x 6	.05
½ x ¾ x 6	.06
⅝ x 1 x 7	.14
¾ x 1 x 8	.18
¾ x 1½ x 10	.25
¾ x 1¼ x 12	.30
1 x 1½ x 15	.48

Balsa Nose Blocks

1"x2"x3" 6 for	.11
1"x3"x5" 6 for	.18
2"x2"x3" 6 for	.15

BAMBOO

1/16 sq. x 12" Gross	.19
1/16 x ¼ x 15" Doz.	.06
Gross	.65

DOWELS

1/16 x 12" 2 Doz.	.18
⅛ x 18" 2 Doz.	.23
3/16 x 36" 1 Doz.	.35

BALSA CARVED PROPS.

5" Doz.	.30
6" Doz.	.38
7" Doz.	.46
8" Doz.	.50
10" 6 for	.40
12" 6 for	.55

PAULOWNIA WOOD HAND-CARVED STAND-ARD PROPS.

5" 6 for	.25
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7" 6 for	.40
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2 oz. Bottles, Doz. .60
3 oz. Bottles, 6 for .59
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½ oz. Bottles, Doz. .35
1 oz. Bottles, Doz. .59
3 oz. Bottles, 6 for .60
1 Quart .75
INSIGNIAS
Dozen sheets .36

WIRE

.020, 100 ft.	.30
.028, 100 ft.	.30
.034, 100 ft.	.30

MODEL DOPE BRUSHES

Small, Doz.	.10
Gross	.75
Regular Size, 2 Doz.	.50

WASHERS
Small or Large 100 .08

JAP. TISSUE
20"x24" Per Doz.

White	.12
Colored	.15
Silver	.36

BROWN RUBBER

1/16 sq., 225 ft.	.48
⅛ Flat, 225 ft.	.50
3/16 Flat, 225 ft.	.60

RENT WIRE PROP. SHAFTS

Dozen	.10
Gross	.75

ALUM. TUBING

O.D. 1/16", 6 ft.	.22
3/32", 6 ft.	.28
⅛", 6 ft.	.33
3/16", 6 ft.	.43
¼", 6 ft.	.56

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12⅛" x 16", Each .15

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Small, 100	.13
Med., 100	.20
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Small, Doz.	.06
Gross	.55
Large, Doz.	.07
Gross	.70

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12 Packages .30

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Per Dozen .85
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2", 6 for	.45
3", 6 for	.55

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1. No order under $2.50 accepted. 2. Send cash with order. No C.O.D. 3. All orders shipped by express—shipping charges collect. Saves time. Costs no more than postage. 4. Add 10c for packing on free kit.

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• Here are the greatest bargains ever offered in a guaranteed, Grade A model cement. Buy in quantity and save. Impossible to overstock; nothing sells faster. This quality product suitable for gas jobs, as well as other types. Freshly packed in attractive bottles to speed sales. Order now. 24 hour service.

½ oz. Btls., corked, per gross (144)	$2.50
1 oz. Btls., screw caps, per gross	$3.50
3 oz. Btls., 3 Dozen	$2.75
Pint Cans, 1 Dozen	$3.00
Quart Cans, 4 Cans	$1.75
1 Gallon Can	$1.50
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tip-loss and increase the stabilizer's effectiveness. Also the fins pass through more or less undisturbed air and out of the backwash of the fuselage. Theoretically this makes them more effective. A parasol wing contributes to the stability of this plane and on the whole it is exceedingly well proportioned. The skid wing mount allows the wing to be adjusted for correct balance.

Picture No. 10 shows Phil Sonheim with his radio-control Forster-powered Dolphin. The unique thing about this plane and its control is the arrangement that Sonheim has installed on the transmitter. He has a joy-stick which is operated in the same manner as the joy-stick on a large ship. When the stick is moved in any position the controls of the plane operate in the same manner as the controls of a large ship. Unfortunately this ship crashed during one of its tests.

In the past twin cylinder engine planes have been few and far between. However, some made their appearance at this year's Nationals. Picture No. 11 shows a single-wheel job with a twin cylinder engine of the builder's own design. The ship has a seven foot span. Upon impact with the ground the wings fall free of the plane. There were many single-wheel gas jobs at the contest and apparently there was little trouble in getting them off the ground.

Picture No. 12 clearly shows how a contestant overcame the objection of one of the judges, i.e. that his fuselage cross-section was not large enough. We refer to the little streamlined box which rests on the top of the fuselage over the wing. Such an arrangement also helps to eliminate the argument as to whether the center section of the wing over the fuselage shall be counted as wing area if the wing rests on top of the fuselage. In this case it can be said that the wing passes through the fuselage.

Another of the unusual little ships at the contest is shown in picture No. 13 with its builder, Mr. Louis Garami. It is the "Molecule" and the total weight is only about thirteen ounces including the engine. It is powered with the new Atom engine which delivers a tremendous amount of power for its weight. Unfortunately Mr. Garami was taken ill at the contest and was unable to demonstrate the fine performance of his little ship.

Picture No. 14 shows a close-up of the Atom. One of the outstanding features of this little power plant is the sleeve valve which fits between the piston and the cylinder wall. This allows a more advantageous timing of the port opening and is very instrumental in the added efficiency which this engine develops.

Picture No. 15 shows the contestants in the act of participating in one of the most important events of the contest: Reading the "Daily Blurb." This was considered the highlight of the Nationals; in fact, the only thing which subdued the restlessness of the audience at the banquet at the end of the contest was the distribution of the "Blurb" to all who attended. This seemed to steep their restless spirit in the humor of its pages.

Another interesting sidelight is the fine performance made by Ohlsson motors. These engines powered planes which won the first 10 places in the Open Event, Class B, and the first 10 places in the Senior and Junior Events, Class B.

There were a number of contestants of the "gentler sex" who flew their ships. One of the outstanding of these was Mrs. Barney Snyder (Peggy). Barney himself (of *Modelcraft*) was also there and gave an excellent performance with his ship. However, the manner in which Peggy prepared and launched her ship deserves special praise. She refused any and all assistance from a number of willing helpers. She adjusted her plane, spun the prop and got the ship under way to a good start on three different occasions. The little ship flew very well but failed to catch a thermal as a rather stiff wind was blowing. Mr. and Mrs. Snyder traveled all the way from the West Coast to compete at the Nationals.

Some of the other prominent leaders who attended this national event were: Mr. Robert K. Allen from Pittsburgh, Pa., who is the director of Unit No. 1 of the rejuvenated I.G.M.A.A.; Pat Sweeney, radio modeler from Chicago; Frank Knapton, whose business is to put on gas model contests in California; Bob Sommers, director of the Stix, Baer & Fuller Model Airplane Club; Mr. Nekimken, in charge of model activities in the Chicago Park System; J. R. Forster of the Forster Brothers; Ed Roberts of the Junior Motors Corporation; Louis Kapitanoff and Bill Bibichkow of the Comet Model Airplane & Supply Company; Joe Howell of the Peerless Model

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"HUSKY" JV. MODEL

Contests after contests are being won with "Husky" powered models—Altitude is what you want when you want it—and the easy starting "Husky" with as much power as some larger motors gives you undisputed supremacy in any class "A" contest. When you buy a "Husky" you can be sure of a square deal—as we guarantee you complete satisfaction.

We have made several new improvements on our latest "Husky"—Special new connecting rod hardened and ground crank shaft made stronger—more power produced by change of carburetor intake and ports—auto type timer, 3-volt coil and new needle valve with spring lock.

Special Notice! We have been asked by our largest dealers to keep the Husky in class "A" N.A.A. ruling—they claim the "Husky" is the leading motor in this class—displacement, .19 cu. in.—win with a Husky—order yours today.

THE "HUSKY" JV NOW COMES TO YOU WITH A 3-VOLT COIL GIVING MUCH HOTTER SPARK, AND STARTS MOTOR INSTANTLY.

Specifications. Wt. ready to run 6¾ oz. with 3-volt coil, condenser, carburetor, plug and two pencells for current. ½" Bore, ½" Stroke—Height 3½". Length 4⅛"—Speed 250 R.P.M. up to 8000 R.P.M. using an 11" prop.

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Husky motor mounts, wt. ⅘ oz., per pr., postpaid 50c
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Husky complete ready to run (less motor mounts, batteries and prop.) Postpaid $12.50

Dealers write for Special HUSKY Discounts
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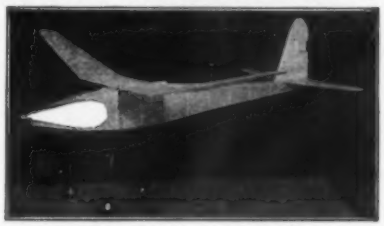
COMPLETE KIT $1.50 post paid



AERO GLIDE—Wingspan 41", length 30", wt. 3 oz. Kit contains all parts to assemble folding propeller—BALL BEARING propeller shaft— M & M model wheels—special brown contest rubber motor—glue, dope, tissue, wing ribs and other parts printed on "AAA" sheet balsa—all strips cut to size—full size detail 3-view drawing.
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Contains ample supply of the highest grade materials to complete model—**and to spare.** Washers, bushings, 8 ft. of toughest power rubber. Ready formed prop shaft—wing and tail tips and fuselage cross braces ready cut. Full size plans with detailed instructions

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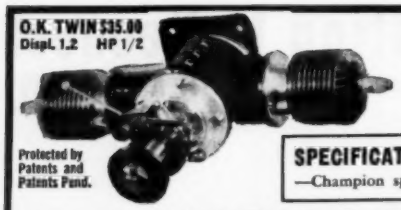

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The "O.K." Twin solves the power problem for the radio control experimenter, the hobbyist flying big ships and for hobbyists in general seeking light weight power applications for canoes, kiyaks, bicycles, gliders, etc.

SPECIFICATIONS: Bore & stroke .900" x .950"—Displ. 1.2—HP ½—R.P.M.'s 800-10,000 (with 18" high pitch prop 5000)—Width overall 7¾"—Weight 22½ oz.—Radial mounting —Champion spark plug—custom-made coil—Ball bearing in front housing taking radial and thrust load.

O. K. MOTORS START EASY—RUN CONSISTENTLY

O.K. DeLuxe..... $21.00
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Be Thrilled With the Power Flow of the O. K.

For Aircraft, Marine, Raceway

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Light, sturdy and powerful for aircraft applications. "O.K." motors are not erratic and hot headed, they keep a cool head in a long race, ideal for marine and raceway. "O.K." motors will stand the shock of a crash or the pounding received on the raceway. Let your next motor be an "O.K."

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NEW 1939 AUSTIN AIRDRAULIC FLIGHT TIMER

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NOTE THESE NEW IMPROVEMENTS

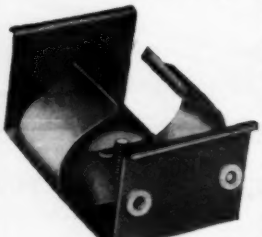
- **Easier adjustment.** New design makes possible quicker, more accurate setting for 20 or 30 second motor runs.
- **Stronger contact spring.** Gives positive contact even under severe motor vibration.
- **Stop watch accuracy.**

The only timer with these exclusive features:

- Adjustable duration from 1 second to 10 minutes.
- Weighs only ¾ of an ounce. The lightest Timer made.
- Only one moving part. Will outlast any mechanical timer.
- Completely enclosed for protection from dust and dirt.
- Oil and Gasoline proof.
- Most dependable timer made. No complicated parts to jam.

• The only Timer to carry an unconditional GUARANTEE against defective parts or workmanship.
• Special instruction sheet with installation and wiring diagram given free with each timer.
• And best of all, the price post paid is **only $1.25**

Austin Battery Boxes



These new battery holders are the most practical way of mounting the batteries in your ship. The cells are held securely in place, yet may be quickly replaced without soldering any connections. The holders may be shifted for balance adjustment from outside the ship by means of an attachment screw. They hold two cells in series. They now come in all three sizes and weigh only ¼, ⅜ and ½ oz. Penlite and 1" dia. sizes, 40c. Large 1¼" dia. size, 50c.

NEW AUSTIN BOOSTER PLUG—IN CONNECTION

A light, inexpensive, practical connection for booster batteries. Any standard lamp cord plug may be used with it. Positive vibration proof contact. Don't take any chances of shorting out your boosters with bare uninsulated clips. Weighs only ⅛ oz. **Price only 35c.** Ordering: on orders up to $1.00 add 5c postage. Send for a free copy of our new catalogue. Contains the latest in supplies, accessories, and stuff for gas models.

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Company; Charles Brebeck of the Herkimer Tool & Model Works; Mr. J. W. Rogers and Mr. André of Syncro Devices; William Winters of *Air Trails;* David Cooke of *Flying Aces;* Irwin Ohlsson and Mr. Rice of Ohlsson & Rice Manufacturing Company and, of course, your editor.

At the contest he represented MODEL AIRPLANE NEWS in suite 1776 at the Fort Shelby Hotel. This quickly attained the nickname of "Liberty Hall"; which we feel is quite appropriate inasmuch as MODEL AIRPLANE NEWS is a great rooter for liberty for the model builders. Liberty in designing ships in any way they may choose; liberty in constructing their ships; liberty in making them any size or form which they may desire; liberty in giving full self-expression to their designing and constructive genius . . . for this is the essence of the spirit of model aviation in America. Unless this characteristic pervades the hobby its purpose will be defeated.

MODEL AIRPLANE NEWS advocates rules which restrain model aviation only within those limits necessitated by safety, and not rules which will limit their expression in this field to the whims of any individual or group of individuals.

Long live model building as a hobby!

Gee Bee "Flying Scale"

(Continued from page 11)

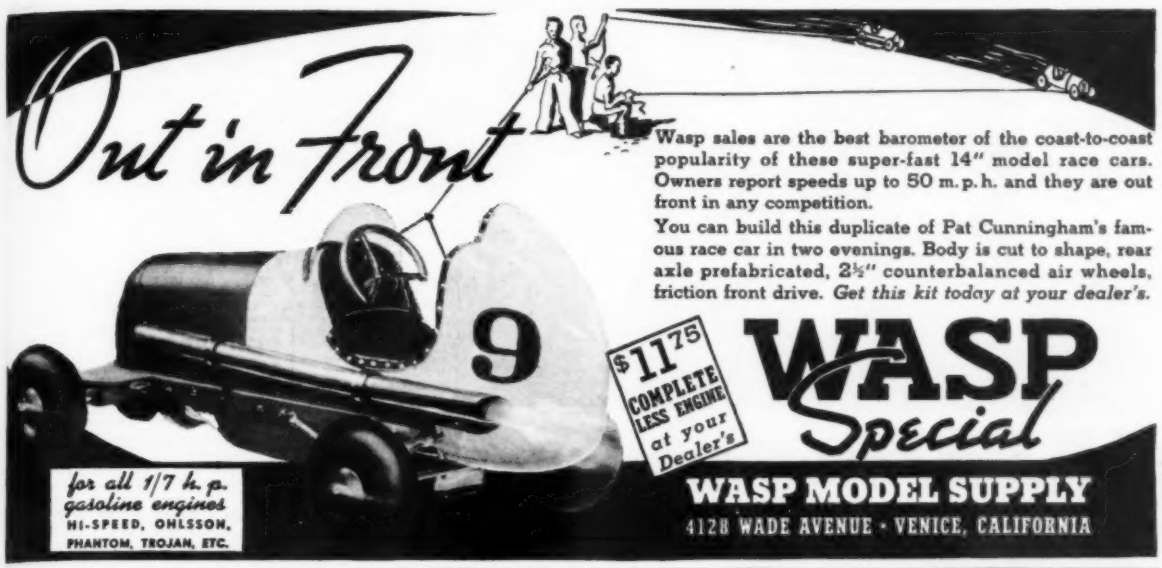
ers are cemented on top of the formers. There are eight stringers to each side of the fuselage and are of medium wood 1/20" square. Cement them to the formers in their respective places, using a thin cement for lightness.

After placing evenly and cementing the stringers in place proceed to cut several long strips of light balsa 1/20" square. Cut these strips into small pieces to fit in between the fuselage stringers. These small pieces when cemented and lined up correctly between the stringers make the formers between A, B, C and D. Notice on the photographs the placing and the neatness of these built-up formers. Notice that former D has a double wall of 1/20" sheet balsa; that is, two formers in one. This is not necessary if the builder does not wish to have the tail removable from the ship.

If the tail is removable for easier winding make former D of two separate pieces. When the ship is finished just cut the sections apart. The best policy is to leave the tail section on the plane and wind the model from the nose instead. It not only helps to make the model look neater, but it is lighter and stronger that way. Make the rear hook of .014 steel or piano wire and cement this hook to former D as indicated on the drawing. The drawings do not indicate the thread windings. However, using a fine grade of silk thread, start at the nose and cement the tip of the thread to it. After this is dry, wind the thread around the fuselage, cementing it to the top and bottom of each former. Continue this all the way back to the tail. Next wind one in the opposite direction. Three or four windings will do depending on the strength of the body. If it is generally weak, use four windings of thread. If fairly strong, use only two windings. Lay the fuselage aside in a safe place where no one will lay a book on it or something.

Next comes the nose block. Select two very light pieces of balsa for the nose block, as shown on the drawings. Trace the side view or outline of the nose block on a sheet of paper and cement it lightly to the block. (Cement the two block halves together lightly around the edges.) Use very little glue as they will be broken later to be holiowed out. Then shape this block to the edge of the side view outline allowing about 1/32" for sanding. Copy the front view outline of the block and glue it to the block. Then cut and sand to the correct shape as shown on the photographs and drawing. Complete by sanding the block with a fine sandpaper. Apply a thin coat of banana oil and sand again. Now cut the two halves of the

(Continued on page 62)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You can build this duplicate of Pat Cunningham's famous race car in two evenings. Body is cut to shape, rear axle prefabricated, 2½" counterbalanced air wheels, friction front drive. *Get this kit today at your dealer's.*

N.A.A.

(Continued from page 21)

Dick Korda	United States		950.2	seconds
Fred Bowers	Canada		272.66	seconds
M. Giovanni	France	Flown by Maurice Schoenbrum	217.53	seconds
Robert Copeland	England		211.03	seconds
Norman Lees	England		168.87	seconds
Robert Chaille	United States		159.83	seconds
Leon Stout	England		152.41	seconds
Lavalle Walters	Canada		150.83	seconds
Vincre	France	Flown by John Zaic	126.33	seconds
Edward S. Booth	Canada		125.86	seconds
Charles Gibson	England		98.1	seconds
Reginald Parham	England		98	seconds
Tournadre	France	Flown by Walter Dickinson	96.94	seconds
Chabot	France	Flown by Roger Hammer	90.03	seconds
Phil Dalgetz	South Africa	Flown by E. Murray	83.83	seconds
Ralph Baker	United States		81.08	seconds
Chinaud	France	Flown by Bruno Marchi	64.66	seconds
Ronald Hill	England		64.66	seconds
	South Africa	Flown by Ted Foti	59.53	seconds
James Thames	United States		58.53	seconds
Barthelmy	France	Flown by Henry Struck	57.01	seconds
Spango	South Africa	Flown by John Ogilvie	54.73	seconds
R. B. Leslie	South Africa	Flown by Hal Hassey	45.83	seconds
James Bohash	United States		41.63	seconds
Gim Wong	Canada	Flown by John Dilly (Canada)	31.23	seconds
P. A. Connolly	South Africa	Flown by Manasian	30.05	seconds
Roy Nelder	Canada		24.16	seconds
Earl Stahl	United States	Flown by Ted Just	20.03	seconds
Endean	South Africa	Flown by George Brown	4.00	seconds

The visiting model fliers were accorded a great welcome upon their arrival and the week which they spent in this country was one round of entertainment and activity. It is impossible in this short space to give you the full details of all that happened; however, following you will find a program of the five days' visit of these contestants:

Friday, August 4th

Noon—12:15

Luncheon in contestants' honor by Mr. Charles H. Grant, Editor of the MODEL AIRPLANE NEWS magazine, at the Midtown House, 22 East 38th St.

Afternoon

Sightseeing. Downtown New York and Statue of Liberty.

Evening—7 P.M.

Benarr Macfadden, the sponsor, had the contestants as his guests for a "get acquainted" Buffet Supper at the Hotel New Yorker.

Saturday, August 5th

Morning—10:30 A.M.

WOR broadcast Model Airplane Club. The contestants and the sponsor, Mr. Macfadden, were interviewed.

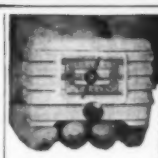
11:00 A.M.

Chartered busses were taken to Aviation Golf Club, adjoining Bendix Airport, Newark, N.J., for final practice.

Noon—12:30

Luncheon at the Club House, guests of Mr. Macfadden.

Captain A. J. Boettner, veteran lighter-than-air pilot, and No. 1 member of the Caterpillar Club, explained the operation of the Goodyear Blimp to the contestants as he took them for a ride over the city.



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Midget radio fits your pocket or purse. Weighs only 4 ozs. Smaller than cigarette package! Receives stations with clear natural tone. **NO CRYSTALS** to adjust—**NO UPKEEP**—only one moving part. Wireless, Tubeless, Batteryless! **ENTIRELY NEW PATENTED DESIGN.** Has enclosed geared luminous dial for perfect tuning. **MANY OWNERS** report amazing reception and distance.

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Sent complete ready to listen, with instructions for use in homes, offices, hotels, boats, in bed, etc. **TAKES ONLY A SECOND TO CONNECT—NO ELECTRICITY NEEDED!**

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We carry all the BEST MOTORS, KITS and SUPPLIES in stock for SAME DAY shipment. ORDER NOW!

Today's most popular size of gas powered model is the intermediate size or Class B. These small, conveniently transported and easily constructed jobs are sweeping the meets all over the country and are proving their deserved popularity. Here at Billett's

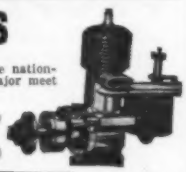
We Stock 'Em All

Modelcraft's New Sensation
Interceptor $2.95
Span 46"
weight 23 oz.
Sky Baby.....$3.85
Span 54"
weight 27 oz.
Miss Tiny, standard kit $2.95
De Luxe kit.....$3.95

Peerless Rocket, 48" span	3.50
Comet Mercury	2.95
Scientific Eaglet	3.95
Megow Cadet	3.95
Buccaneer—48	2.95
Cavalier—60	4.95

ALL THE BEST CLASS B MOTORS

Get a winner—first at the nationals and at every other major meet in the country.



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1/7 hp. $16.50

Hi-Speed	$12.75
M & M .29	16.50
Trojan	19.50

Orders for $1.00 or more shipped postpaid SAME DAY. Send your order to us for any kits or supplies advertised by Peerless, Comet, Megow, Burd, Berkeley, Denny, Aircraft, Scientific, Ohlsson, Modelcraft.

DEALERS: We distribute all the above lines. Write on your letterhead for our attractive proposition.

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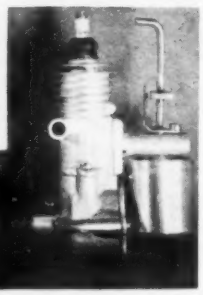
20 YEARS MAKING BEST MOTORS

BELMONT MOTORS

MOTORS COME COMPLETE WITH SMITH COIL, CHAMPION SPARK PLUG AND CONDENSER

THE GNAT $7.95



Present the Motors of Tomorrow

THE BELMONT		THE GNAT	
Bore	7/8	Bore	9/16
Stroke	15/16	Stroke	5/8
R.P.M.	8600	R.P.M.	7500
H.P.	1/4+	H.P.	1/10
Weight	9 oz.	Weight	4½ oz.
Displacement	525 cu. in.	Displacement	156 cu. in.
Height	4¼"	Height	3"
Length	5⅝"	Length	3"
Width	2"	Width	1¼"
Propeller	15"	Propeller	10"
Pitch	12"	Pitch	8"
Fly planes up to 8 lbs. with 8 ft. wing spread.		Fly planes up to 2½ lbs. with 5½ ft. wing spread.	

DEALERS WANTED

Motors may be run inverted.

3 BIG ADVANCES

1—STARTING—Positive Starting — No Time Lost In Useless "Cranking"—Gets Your "Baby" Into the Air.
2—OIL SYSTEM—Revolutionary Design—Protects Your "Points"—No Fouling.
3—GAS FEED—Belmont's Exclusive 90° Feed Insures Smoothest Motor on the Market—Order Yours Today.

Greatest in Model Motor Building—No Power Waste—No Stuttering.

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WHITFIELD'S AMERICAN STAR BRAND

BAM-BOO TISSUE

Colors: Natural, Red, Yellow, Blue and Green—All brilliant

"BRILLIANT"
Japanese Tissue
IN 32 COLORS
Thin and Strong

PROPELLERS
The following types in stock:
HELICAL STANDARD BROAD BLADE STEEL TYPE

MINIATURE CELLULOID MOTORS
4 sizes: 1½"; 2"; 2½"; 3"
Another Japanese Import

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76 VARICK ST. NEW YORK CITY
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The rest of the afternoon was spent in testing models.

Evening

Trip through the Daily News plant.

Sunday, August 6th

Morning and Afternoon

9:00 A.M. to 6:00 P.M.—Left Hotel New Yorker by special busses for Aviation Golf Club, adjoining Bendix Airport, Newark, N.J. Box lunch on grounds.

Monday, August 7th

Morning—10:30 A.M.

Trip to Newark Airport from which visiting contestants were flown over the city in airliner.

Noon—12:15

Guests of the Kresge Aero Club for luncheon at the Kresge Dining Room in Newark.

Afternoon—3 or 3:30 P.M.

Trip through Radio City and the Museum of Science and Industry.

Evening—7:00

Victory dinner at the Hotel Ambassador, where the Wakefield Trophy and other prizes were presented.

This dinner was given under the auspices of the Greater New York Chapter of the National Aeronautics Association and the sponsor, Bernarr Macfadden.

Tuesday, August 8th

World's Fair Day

Morning—10:00

Inspection of North Beach Airport.

11:00

Greeted at the Summer City Hall by Mayor LaGuardia.

Noon—1:00

Greeted by Grover Whalen.

Luncheon as the guests of Mrs. Winthrop Aldrich and her panel of hostesses of the National Advisory Committee in the National Advisory Building of the World's Fair, after which the contestants saw the Fair.

NOVEMBER ISSUE
On Sale Oct. 8th

News From National Headquarters Concerning State Records, Contest Listings

Good news for all members of the N.A.A. Model Division!

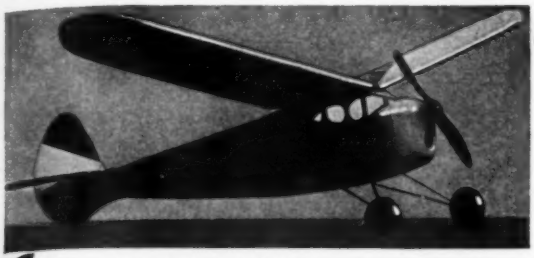
The Contest Board of the National Aeronautic Association has approved a plan to recognize State-wide model aircraft duration records from its Washington headquarters. By the time this reaches print, provision will be made for the issuing of Class A. Model Builder and Flier's Brevet to holders of State duration marks.

As in the case of National records, application on behalf of the record-breaking contestant will be made by the Contest Director of the meet or record trial in which the new mark was set. Eligible to set rubber-powered and glider records will be all "affiliated" club members as well as holders of the $1 Rubber-power flier's license; in the gas categories, record breakers must hold the regular $1 gas license, the same as is required for setting a national gas record.

National records will count, of course, as state records in the state in which the record flight was made, regardless of the home port of the model builder.

With this announcement the Contest Board states that the Class A Model Builder and Flier's Brevet will no longer be issued for qualifying flights of 2 minutes indoors, 1 minute outdoors, as was done previously. From now on the pocket-size Brevets will go only to state-record holders.

The Model Division of the N.A.A. realizing that many local contests are held for novice builders with great popularity, and that there is no real need for these meets to be sanctioned, announces that it will include among its official contest calendar in MODEL AIRPLANE NEWS all competitions which are conducted under its rules. Therefore, even if your meet, regardless of how small is may be, isn't sanctioned, but is conducted under Association rules, send in a notice of it to Washington, (Dupont Circle) and it'll be included among our contest notices.



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Gas License Decal Numerals Appear on Autos, Workshop Windows, Trailers!

An innovation we must call to your attention is the practice instituted by a number of licensed gas modelers who want the world to know of their N.A.A. affiliation. Some of these chaps have obtained extra sets of their decal license numerals and now appear with them on the family flivver as well as affixing their license numbers to their workshop windows. One case called to our attention was a club trailer on which each member had placed a duplicate of his license number. Looked like quite an impressive array of licensees belonged to that club!

If you're "like-minded" we pass along the information that duplicate sets of your gas license number in decal form may be obtained from the N.A.A. Model Division (Dupone Circle, Washington, D.C.) at 25c the set.

Results of Academy Meeting in Detroit

The N.A.A.'s governing group for model aviation activity in the United States, the Academy of Model Aeronautics, held its semi-annual session in Detroit in conjunction with the National Contest last July.

Although no rule refinements could be made at the gathering under the A.M.A. ruling which permits changes only once a year (on January 1st), the feelings of the members present on various phases of the activity showed that a majority voted.

1. The Academy's November gathering should be held at Langley Field, Virginia, in conjunction with the 2nd annual National Model Aircraft Forum. The A.M.A. has been invited to hold its session at the Government's Virginia Center for aeronautical research by the Hampton Roads Chapter of the Virginia Model Association.

2. That some sort of a blackboard scoring system should be used at large contests such as the National Meet so entrants can see at all times what flights have been credited to them.

3. That the 3-flight-average ruling has proven itself unnecessary for indoor and outdoor rubber and glider flights; that it should be continued in the gas categories, but that the longest high-flight method of judging rubber and glider events should be reinstated next year.

4. It was suggested that the Class A category for small bore gas models should have its maximum wing area increased to 250 sq. inches; that the wing loading for Class B models should be increased to 9 ounces per sq. ft. and that the wing loading for Class C gas models should be increased to 10 ounces per sq. ft. of wing area. It was further agreed among members of the Academy present that the official motor run for sanctioned competition (i.e.,—record flights) should be lowered to 15 seconds, with a corresponding lowering of the delayed flight time for gas models to 30 seconds.

5. It was voted to pass along to other members of the Academy for consideration the decision that "one-wheel" models must have twin-rudders or tail or fuselage skids which would permit them to take off and land unassisted in a "normal attitude." This would mean a model must be able to get into the air, land and remain at rest without scraping a wing tip or nosing over.

6. It was agreed that the rules should be extended to include a model dropping no parts "during flights or take off." This would plainly prevent "cradle take-off" arrangements, even though such devices are barred by the present regulations. The thought of the assembly was that the regulations should be plain enough so the most inexperienced modeler could answer all his own questions regarding model and sanctioned flights by referring to the official rules.

7. It was felt the rule stating a model may be guided should not designate at what point, since various contestants desire to hold their craft at different points. As long as the model was guided and not pushed, it was deemed not necessary to state at just what point or in what position the flyer should "grasp" his craft.

Further discussion centered around the

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1/8x1/4-...5 for 5c
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1/4x1/4-...3 for 5c
3/8x1/8-.3 for 10c
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3/8x3/8-...each, 4c
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1x1 5c; 1½x2 6c
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1x3 15c; 2x2 18c
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6"	5c	15c
7"	6c	20c
8"	7c	25c
9"	8c	30c
10"	8c	35c
12"	10c	45c
14"	14c	
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2 sheets 3c
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.050.....3 ft. 5c
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Doz. 8c

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All col., doz. 19c
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possibility of encouraging original designs at National Contests and the advisability of standardizing awards.

The meeting was under the direction of Edward R. Roberts, Academy President, and was attended by half a hundred Academy members from all sections of the United States.

Some sanctioned meets in September and October you'll want to take in:

September 9—Philadelphia, Pa. Quaker City Gas Model Airplane Association will hold 3rd annual Invitation meet at Philadelphia Municipal Airport. Trophies and merchandise. Write to: William Beck, 209 Righter St., Phila.

September 10—Rockford, Ill. Gas Bugs to hold 2nd annual gas meet at their own "airport." Cash and merchandise prizes. Write to: R. K. Wilson, 411 E. State St., Rockford, Ill.

September 10—Albany, N.Y. Capitol District Aeronautic Association will run a gas battle at Albany airport. Prizes: cash and merchandise. Write to: Albert L. Hurd, 17 Steuben St., Albany.

September 10—Clifton, N.J. Middle Atlantic States Rubber-Power Championship Meet at Delawanna Airport. Trophies and $50 (at least!) in prizes. Write: Albert Casano, 142 Columbia Ave., Passaic, N.J.

September 17—Pittsburgh, Pa. All-event meet at Allegheny County Model Airfield. Merchandise prizes. Write: Harry G. Volger, Jr., 303 Lowell St., Pittsburgh.

October 14, 15—Akron, Ohio. Akron Women's Chapter to hold a glider, gas and rubber meet at Municipal Airport. Write: Mrs. Frances Alexander, 792 W. Market St., Akron.

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Gee Bee "Flying Scale"

(Continued from page 58)

nose block apart with a razor blade at the center. A small gouge was used to hollow out the block. If the wood is soft, a knife or razor blade will do the trick. Cement the two halves together "for good" now and sand the walls to about one-sixteenth of an inch. Glue the finished product to the fuselage and put both aside to be covered with film later.

The construction of the pants and wheels is identical to that of the nose block. Choose a light grade of balsa good for cutting. Hollow the pants and wheels to a wall thinness of one-hundredth of an inch at least, to make them very light. Use a light type of wire for the axles and set the wheels in the pants accurately. Make the landing gear struts of 3/32" soft sheet balsa. Sand smooth to a streamlined section shape. Check the above various parts carefully and if there is no scale available use your judgment and build them as light as possible, leaving just enough strength in them to hold up the model, of course.

Wing

Start the wing by making a balsa or cardboard template of the wing rib. Cut sixteen top ribs out of 1/20" thick sheet balsa. Then four top and twenty bottom ribs out of 1/16" thick sheet balsa. Put these ribs aside and start on the wing spars.

Cut and sand the two leading edge spars to the dimensions of 1/8" round at the center, to 1/16" round at the tips. These two spars are 13" long. Trailing edge spars are 3/32" x 1/8" oval in section and taper to 3/32" round at X on the drawing. These pieces are 9-1/8" long. The tip pieces taper from 3/32" round at X to 3/64" at their tips. Use a curling iron or anything that can be used to bend these tip spars to the shape on the drawing. Next, pin the completed spars to the full-size wing layout you have drawn. Cement all the top ribs in place with a thin glue, triming the trailing edge of these ribs off to the right size as they are glued in place. When this frame work has fully dried cut it from the drawing and glue in the bottom ribs. Slice out two pieces out of light wood, which will make up the main spar. They should each measure 15-3/16" in length. Finish to dimensions on the drawing. Then cement these two main wing spars into the wing, but do not cement them together at the center yet.

Now take the fuselage and cement the wing in its place, cutting the trailing edge at the center and cementing it flush to the bottom of the fuselage lower longeron. Do the same with the leading edge and the middle main spar, at the same time making sure that the wing tips have four degrees of dihedral in them. The dihedral should be 1-1/8" at each wing tip. Next, cement in the few extra pieces of light balsa between the wing ribs and the fuselage, as shown in the photos. Glue two pieces of balsa 1/8" x 1/16" x 5 and 3/8" long at the landing gear rib.

Elevator

The elevator is constructed the same

way as the wing. Follow the dimensions on the drawing. Take a piece of fine silk thread and split it three ways. Split several yards of this thread in this way and cement the thread lines running along the wing, rudder and elevator. Pull these lines fairly tight, watching carefully that the various surfaces are not warped in tightening and cementing. These lines with the right tension help to prevent the film surfaces from sticking together on the ship. The wing has four of the lines running along the top ribs and three along the lower ribs; the elevator has two on the top and two on the bottom surface.

Propeller

The scale block measures 8-1/8" x 3/8" x 5/8". If using a higher pitched propeller remember that it will turn slower than a lower pitched propeller on the same power. The finished prop blades should taper from 3/32" at the hub to 1/32" at the tip. The blades may be made a little thinner by cutting them out of a harder grade of wood.

Wing and Landing Gear Struts

These struts are cut out of 1/16" sheet wood. All are 1/4" wide. The front wing struts are 2-1/8" long. Rear ones are 2-1/4" in length. The two landing gear struts are 4-1/16" long. Sand all struts with fine sandpaper. The front wing struts are glued later about one inch from the leading edge of the wing on the rib that the landing gear is glued to. The rear ones are 1-1/4" from the trailing edge of the wing. Examine photographs for details in placing.

Microfilm Covering

At first glance it would seem that it is difficult to cover this ship with film. It's not, though, once one is used to handling microfilm. Take the body with the wing attached to it and prepare to cover the body first. Lest we forget, have plenty of film sheets on hand. Lay a sheet of film out horizontally suspended between two chair backs. Use a soft wide brush to apply a coating of water to the first side of the body. Brush this water or saliva from the nose to the tip of the rudder. Don't spare the water for it will evaporate later. Cut a small hole in the sheet of film slightly larger than the wing section. Being careful, slide the uncovered wing half down through this opening and lay the body on the film. Using a red-hot wire, slice out the top section of the film and while cutting around the body side roll the body towards the uncut film and make sure it has stuck to the body all the way around. At least one-half of the body can be covered in this way.

Repeat the procedure to cover the other body side. If a few openings or holes are present they may be covered with film patches. The secret of covering a round or oval fuselage with film is in rolling the wet body over the film slowly and at the same time, while cutting the edges with the iron, noting that the tension is not too great in stretching the film. For if it is, the film sheet will split and then it would be better to start over again if a very neat ship is desired. All in all, it's a case of knowing how to control the "shake in one's nerves" to go with the film operation.

When the body and the rudder is completely covered start the wing. Cover the bottom of the wing using a sheet slightly longer than the wing span and wider than the width or chord. Moisten the bottom of the wing and place it on this film sheet. Cut out with a hot wire as was done on the fuselage. Cover the top section of the wing in halves, one-half at a time, placing the film as close to the body as possible. Next cement the two elevator halves to the fuselage. Cover the top and bottom of both with film.

Then cement the landing gear, all struts in place and the wing wires which are thread. And there is a beauty of a model ready for flying. Go to it!

Flying the Model

This ship should weigh close to three-tenths of an ounce minus the rubber motor. With the motor, which is four strands of 3/32" flat brown rubber, about four-tenths of an ounce. Test the ship with a short, lighter motor first. When it takes off it will tend to turn in a sharp circle with the prop torque; that is, toward the left. Straighten out the circle a bit by warping the trailing edge of the left wing down and turning the rudder about one-eighth of an inch toward the right. If the model tends to be tail heavy add a small amount of clay in the nose block until it is balanced correctly. The center of gravity on the model should come about three inches back of the lead-

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ing edge of the wing close to the bottom of the fuselage. Glide the ship about six inches from the floor and if the glide is correct wind the motor about three hundred turns for a test flight. The writer's model consistently turned in flights from one to two minutes. A high time of two minutes and six seconds proved to be the best to date. Handle the model with the utmost care in testing and it will prove to be the best indoor flying scale model in your town. For a good climb use about 1/8" down thrust in the prop.

Flying Scale Designs

In choosing a good scale model design keep the following thoughts in mind for they will prove to be ample in flying the ship: Pick a plane with a fairly large elevator, at least twenty per cent of the wing area. A large propeller, long nose and plenty of dihedral are always a boon in flying a ship of this type. Of course the trouble is that probably not one ship in many designs to choose from will have all of the mentioned qualities. This writer has built quite a number of flying scale jobs; high-wings, mid-wings and low-wings. Among them all, he has found that the low-wing designs have been the best for flying as most low-wing planes have the qualities mentioned as best for flying scale models. However, perhaps that is just a matter of opinion, since many have had success with high-wing designs. On low-wings a small elevator and long tapered wing combination wasn't very successful from the standpoint of a reliable and consistent flyer for indoor endurance work.

The wing section is responsible for success in a big way. Pick a scale ship for flying with a thin high lift section. The tendency in a streamlined section is more towards speed which may prove to be uncontrollable, depending on the individual builder's skill in flying a model with such a wing section. There are exceptions to every rule in flying a ship of this type, depending on the balance and natural stable qualities of the design involved. In constructing an indoor flying scale model select and place the heaviest and lightest materials in the right spots on the model. For example, it would be foolish to spend a great deal of time on a model only to discover in tests that the center section of the fuselage is weak and unable to take the strain of the motor when fully wound or that any part of the ship will not support itself in flight.

In conclusion, it is possible while the model is under construction, to place all materials, hard and light, at the best points on the model which will stand up under power and in flight regardless of how light the complete ship may be. The rule for this might be called, "getting the feel of the materials that one is working with," in many lines this is true regardless whether it be a hobby or a position in the world.

Since a singer must study many years to get the feel of his voice, a musician his instrument, so with a model builder (though in a hobby way), being an artist also, through patience and very careful workmanship must feel his way into the secrets of successful model building.

CLASSIFIED DIRECTORY

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DEALERS, Jobbers—Real profits on rubber and gas supplies. Stamp brings wholesale list. Modelers write for retail list. Waterbury Model Builders Supply, 119 Cherry St., Waterbury, Conn.

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FREE 1939 Catalog, Low Prices, High Quality Supplies, on Gas and Rubber Powered Models. Leader Model Airplane, 5130 So. Damen Ave., Chicago, Ill.

CATALOG on model airplanes, boats, engines, supplies and accessories, 5c. Capital City Model Shop, 71A E. Arch at Jackson, St. Paul, Minn.

SKIBUG—Ready to fly—22" transport model. Sheet balsa. Flight 500 to 1000 feet. Weight 2 oz. Flight tested. $2.25 postpaid. Trojan Novelties, 424 Canal Street, Troy, Ohio.

DRAFTSMAN Wanted; young man in Metropolitan Area familiar with model aircraft design. Permanent position if satisfactory with leading firm. Write stating age, qualifications, and salary expected. Enclose sample of draftsmanship. Drawer A, c/o Model Airplane News, 551 Fifth Ave., N.Y.C.

DOPE—Fresh Nitrate—Full Strength. A good finish improves looks, gilding angle and strength. Prices: Clear dope and thinner, pt. 35c, qt. 55c; color dope and retarder, pt. 40c, qt. 75c. Combination offer—1 pt. each of clear, color and thinner, $1.00 postpaid. Colors, blue, yellow, red, black, white, silver. Postage, 10c on all orders. Send M.O. (cash at own risk.) R. Canfield Co., 13133 Balfour, Royal Oak, Mich.

MAKE your motor a better motor. Get a fixed jet carburetor. Special introductory offer. Write today. Emil Rahm, 117-35 123 St., South Ozone Park, N.Y.

AIRPLANE PHOTOS—3c each, Army, Navy, Commercial. Pictures 2¾ x 4½. Over 1000 views. Send 5c for latest list. Clark's Photos, 46 Ft. Washington Ave., N.Y.

ATTENTION! Gas & Rubber Model Builders. We stock airplane kits and sell and service motors. We have Burd's, Korda and Thermalidet. New England Miniature Motor Service, 6 Jefferson St., Winthrop, Mass.

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COMET Gas Models continue WINNING WAYS!

F-L-A-S-H!

Zipper Flight Exceeds World's Record!

At Corpus Christi, Texas, Sun., Aug. 14th, Jerry Heller's Zipper took first in senior division with time of 1 hr., 10 min., 55:02 sec., exceeding existing world's record!

Sweeping Victories at the NATIONALS Followed by NEW TRIUMPHS!

WHAT A CLIMB! 2,000 feet per minute! The Zipper's breath-taking climb and floating glide are carrying it to success in meets throughout the country! And it's as great in value as it is in performance—an amazingly complete kit with many finished parts. Features include detachable motor unit and battery tract, "automatic pilot" wing mount, shock-proof wing and tail, finished motor lock fittings, and many others.

Kit No. T10

$3.95

Postage 25c: none if ordered from dealer.

WITH model-builders still talking about the remarkable achievements of Comet Gas Models at the Nationals, the Comet Zipper, Mercury and Clipper are roaring on to new triumphs! When Comet models took 5 firsts out of a possible 6 at Detroit it was evident that these models were far ahead of the field in design, performance and features! Since the Nationals, these Comet models have swept meet after meet, winning firsts and other places with amazing regularity. In fact, the number of places in each event taken by Comet models is convincing proof of their superiority! The ease with which you can construct the Comet Zipper or Mercury and make dozens of successful flights, will give you your biggest gas model thrills!

CARL GOLDBERG, gas model wizard and designer of these sensational Comet gas models.

—here's the PROOF!

Half the Prizes to Comet Clippers! At a gas model meet held on Sunday, August 13, at Portsmouth, Ohio, three of the six prizes won went to model-builders flying Comet Clippers—Albert Rice, 1st—John Maguet, 2nd—Frank Draper, 3rd.

●

Takes First in Mississippi Valley Meet! Flash! First place in Mississippi Valley Meet held at St. Louis on August 13 and 14, taken by Roy Wriston, flying a Comet Clipper!

●

Sets New Canadian Record With Zipper! "On July 16th, my Comet Zipper flew 5 min. 23 sec. on a 27 sec. engine run—breaking all existing senior and adult gas model records in Canada."

Warren Hall, Toronto, Ont., Canada.

●

Comet Models Take All Major Prizes! Zippers and Mercurys won all major prizes at Southwest Championship Meet in Dallas, Sun., July 30th. Twelve flew out of sight.

John E. Clemens.

●

Zipper First in Sioux City Contest! "Just returned from an N.A.A. Contest at Sioux City, Iowa, where I won first place in the open gas event with my Zipper, which averaged close to 2 min. in a 20-mile wind, and was the only ship which did not seem to be bothered about it."

Bill Miller, Sioux Falls, So. Dakota.

ESPECIALLY DESIGNED FOR THE SMALL MOTOR,

the Comet Mercury is a simplified sister-ship to the Comet Zipper. Equally outstanding in its class, and equally impressive in specifications, kit contents and value.

Kit No. T11

$2.95

Postage 25c: none if ordered from dealer.

First and Second Places to Comet Models! In the meet held at Ottumwa, Iowa, on June 18th, first place was taken by Claude D. McCullough, whose Comet Clipper scored the high time of 4 min. 35 sec.; second place went to Geo. Schliecher, flying a Comet Zipper.

●

"Spectators Gasped With Amazement! With an astonishing flight of 13 min. 33 sec., A. L. Buck of Ventura yesterday won the sweepstakes prize in the fourth model plane meet sponsored by the San Diego Aeroneers with his Comet Zipper powered with an Ohlsson 23. 1400 spectators saw Buck's Zipper soar virtually out of sight and then glide back to the landing field."

From "San Diego Union" June 24th.

●

Zippers Take First and Second at Buffalo—First place in air meet held by Junior Chamber of Commerce of Buffalo on June 18th taken by Charles Thomas; second place by Clarence Quillen—both flying Comet Zippers.

●

Zipper Wins in Fort Wayne Meet—Comet Zipper won first place in a field of 140 entries, with a flight of 31½ min.!

●

Takes First Place With Comet Clipper—John Fraser of Portland, Maine, took first place in Gas Model Meet at Portland, Maine, with his Comet Clipper, which passed from view of timers after 9 min. 18½ sec. in air.

A NEW 1939 CLIPPER,

incorporating all the latest, approved ideas in gas model construction, including aluminum motor mounts, improved detachable motor unit, improved, sturdy wing with polyhedral, etc.

Kit No. T7

$4.95

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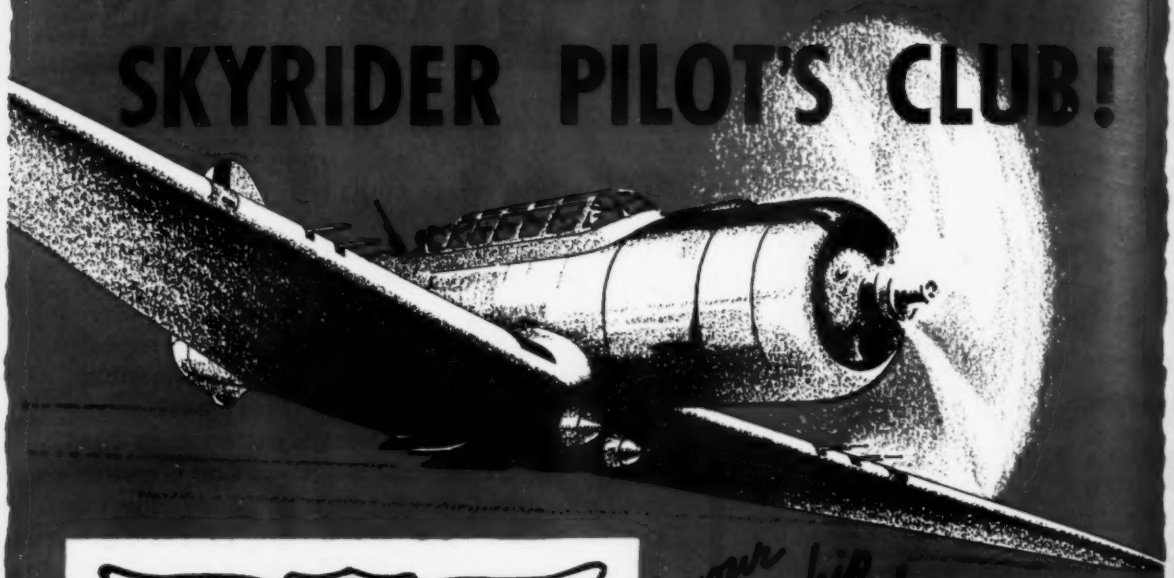

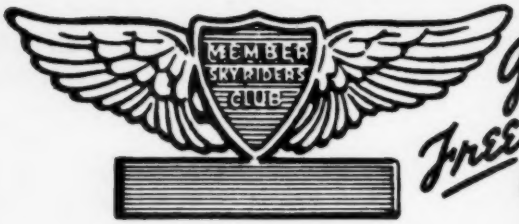

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